Cal CPA Education Foundation
2009 Business Valuation Conference
May 14, 2009

Cost of Capital for Distressed Companies

By: Roger J. Grabowski, ASA

Duff & Phelps, LLC.

roger.grabowski@duffandphelps.com

312-697-4720

Disclaimer

Any opinions presented in this seminar are those of Roger J. Grabowski and do not represent the official position of the California CPA Education Foundation, American Society of Appraisers, the Business Valuation Committee of the ASA or Duff & Phelps, LLC. This material is offered for educational purposes with the understanding that neither the author, the California CPA Education Foundation, the American Society of Appraisers, or Duff & Phelps LLC are not engaged in rendering legal, accounting or any other professional service through presentation of this material.

The information presented in this seminar has been obtained with the greatest of care from sources believed to be reliable, but is not guaranteed to be complete, accurate or timely. The California CPA Education Foundation, American Society of Appraisers, and Duff & Phelps LLC expressly disclaim any liability, including incidental or consequential damages, arising from the use of this material or any errors or omissions that may be contained in it.

What Is The Cost of Capital?

- The cost of capital is equal to the return that could have been expected on alternative investments given a specific level of risk
- Three different meanings to three different users:
  - Asset view: Discount rate used to discount future values of cash flows to be derived from assets to present value
  - Liability view: Economic cost to a firm of attracting and retaining capital where investors carefully analyze and compare all return-generating opportunities
  - Investor’s view: Return one expects from his or her investments in a firm’s debt or equity, given a specific level of risk for the investment

What Is The Cost of Capital?

- The cost of capital is equal to the return that could have been expected on alternative investments given a specific level of risk
- Three different meanings to three different users:
  - Asset view: Discount rate used to discount future values of cash flows to be derived from assets to present value
  - Liability view: Economic cost to a firm of attracting and retaining capital where investors carefully analyze and compare all return-generating opportunities
  - Investor's view: Return one expects from his or her investments in a firm's debt or equity, given a specific level of risk for the investment

Use of Expected Returns

		Assets		Liabilities		Investor
Expected Return	=	Discount Rate used in Valuations	=	Cost of Capital	=	Expected Return

Underlying Assumptions of the Cost of Capital

- Forward-looking - represents expected return given future risks
- Most common assumption used by appraisers of closely-held businesses: Long-term investment in 100% of entity
  - When valuing a company, one typically assumes that the company will remain a going concern.
  - Even though an investor's projected holding period might only be one or two years, the rest of the market will price the investment on a long-term basis.
- The cost of capital is always a function of the risk of the investment, not the cost of funds of a particular investor.

Implications of Having a Forward - Looking Cost of Capital

- Since expected future cash flows are being valued, the cost of capital needs to be a predictive value as of the valuation date.
- Cost of capital must be estimated using an expectational model.
- Past performance can be used as a guide, but realized historical returns will not be the only determinant of current expectations.

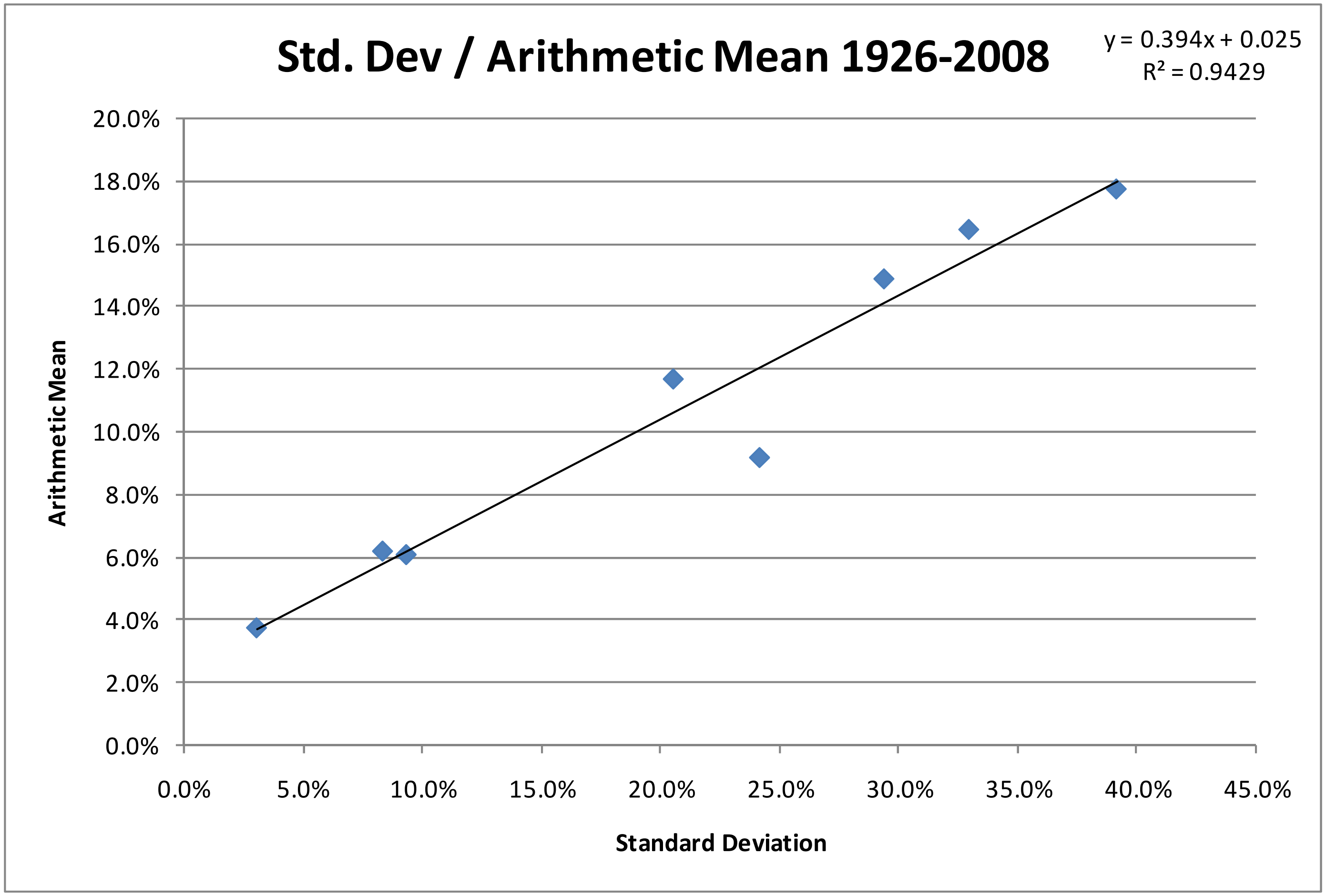
Where Does the Idea of the Cost of Capital Come From?

- Observed relationship between risk and return
- Factors included in the cost of capital:
  - The time value of money - opportunity cost of not having it today
  - Risk premium depending on the certainty of realizing expected future cash flows

Historic Equity and Bond Risk and Return

1926-2008	Arithmetic Mean	Standard Deviation
Large Company Stocks	11.7%	20.6%
Ibbotson Small Company Stocks	16.4%	33.0%
Mid-Cap Stocks	9.2%	24.2%
Low-Cap Stocks	14.9%	29.4%
Micro-Cap Stocks	17.7%	39.2%
Ibbotson Long-Term Corporate Bonds	6.2%	8.4%
Ibbotson Long-Term Government Bonds	6.1%	9.4%
Treasury Bills	3.8%	3.1%

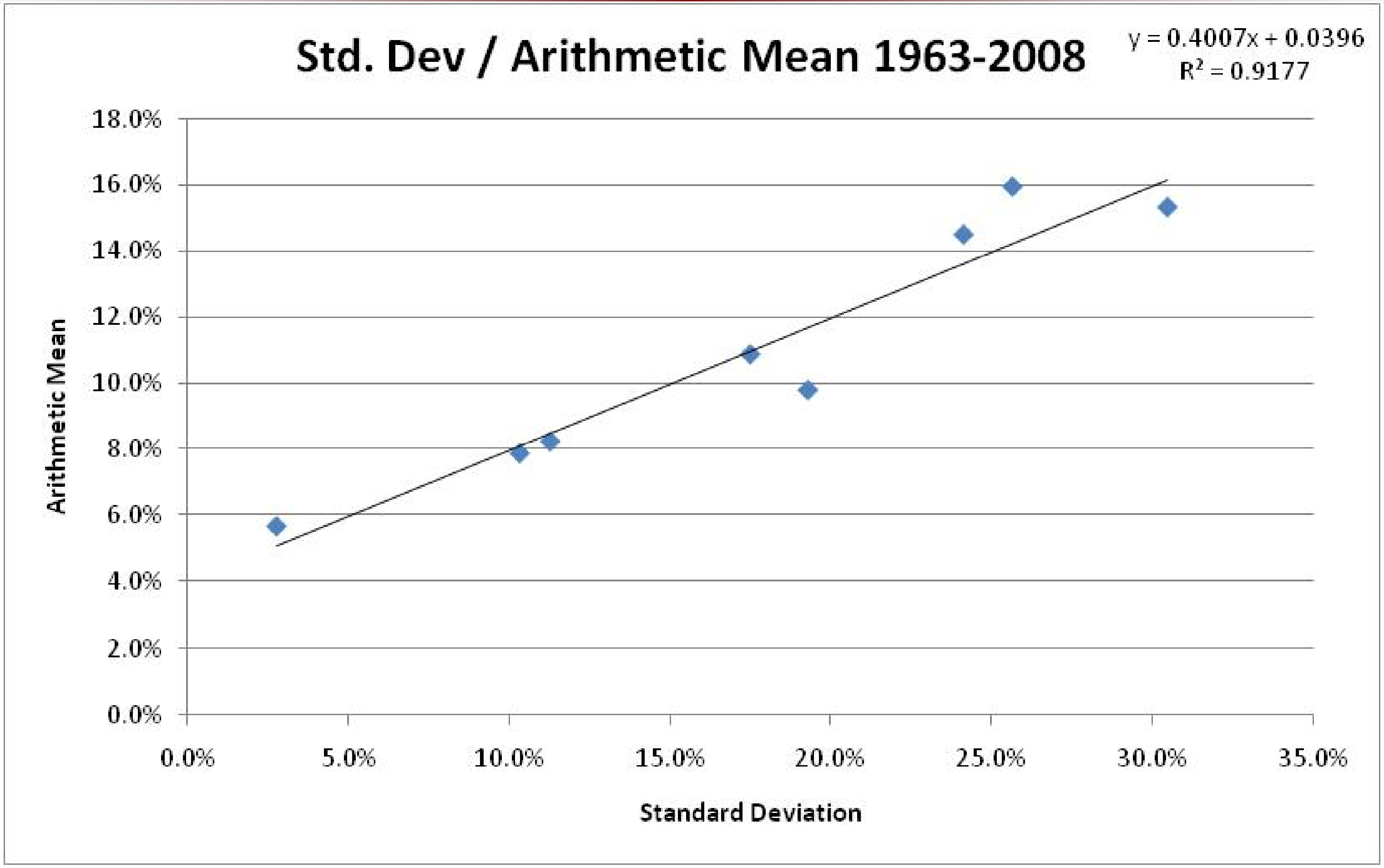
Historic Equity and Bond Risk and Return (cont'd)



Historic Equity and Bond Risk and Return (cont'd)

1963-2008	Arithmetic Mean	Standard Deviation
Large Company Stocks	10.9%	17.5%
Ibbotson Small Company Stocks	16.0%	25.6%
Mid-Cap Stocks	9.8%	19.3%
Low-Cap Stocks	14.5%	24.1%
Micro-Cap Stocks	15.3%	30.5%
Ibbotson Long-Term Corporate Bonds	7.9%	10.3%
Ibbotson Long-Term Government Bonds	8.2%	11.3%
Treasury Bills	5.7%	2.8%

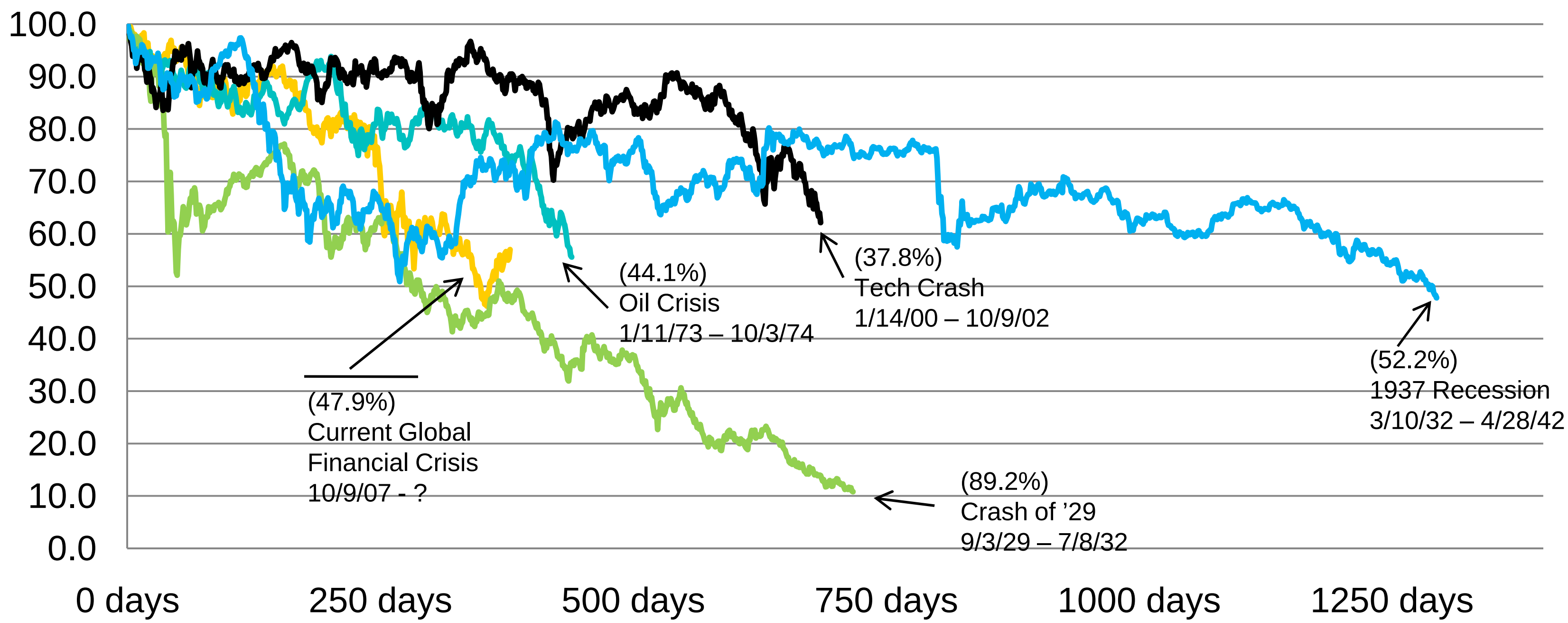
Historic Equity and Bond Risk and Return (cont'd)



The Current Bear Market – In Historical Context

- The current bear market represents one of the most powerful declines in history

DJIA During the Worst Bear Markets



Source: Bloomberg as of April 10, 2009. Number of days from peak of previous bull market to low of bear market.

Equity Cost of Capital

General form:

- Expected return = Risk-free rate + [β_1 x $\boldsymbol{RP_1}$] + [β_2 x $\boldsymbol{RP_2}$] + [β_3 x $\boldsymbol{RP_3}$]+ …

Methods used to estimate Expected return or Cost of equity capital:

- Build-up method: $E(R_i) = R_f + RP_m + RP_s + RP_u$
- Capital Asset Pricing Model (CAPM): $E(R_i) = R_f + \beta(RP_m)$
- “Modified” or “Adjusted” CAPM (adjusted for size and specific company risk):

$$E(R_i) = R_f + \beta(RP_m) + RP_s + RP_u$$

- Implied or DCF method (e.g., $k = D_1 / P + g$)
- Multi-Factor models (e.g., APT, Fama-French 3 factor model)
- Market-derived Capital Pricing Model (MCPM) (based on implied volatility derived from traded options)

Textbook approaches define risk-free rate and risk premium over same time period (i.e., investment holding period) and assume risk premium constant, but mute over how long the time period is.

Issues with R_f = Risk-free rate of return

- The general notion of a "risk-free rate" is that it is equivalent to the return available on a security that the market generally perceives as free of the risk of default as of the valuation date. Analysts typically use the yield to maturity on U.S. government securities as of the valuation date, as proxy for the risk-free rate.
- Conceptually, the risk-free rate reflects a return on the following three components: *Rental rate*; *Inflation*; *Maturity risk or investment rate risk.*

Issues with R_f = Risk-free rate of return

- Most analysts would agree that the world economies are in crisis. Financial crises are often accompanied by a "flight to quality" such that the nominal returns on "risk-free" securities fall dramatically for reasons other than inflation expectations. Recent macroeconomic research suggests that inflation expectations are fairly stable, and therefore the dramatic decline in the T-bond yields in November and December 2008 is unlikely due to expected declines in expected long-term inflation. In fact, long term (10-year horizon) Consumer Price Index (CPI) expectations continued to be at 2.5 percent at the end of 2008.
- At December 31, 2008, U.S. Treasury bond ("T-bond") yields, the typical benchmark used in either the Build-up or Capital Asset Pricing Model ("CAPM") methods of estimating cost of equity capital, were likely temporarily low, resulting in low estimates of cost of equity capital.

Yields on 20-Year (Constant Maturity) T-Bonds

Time Period		Yield
2004 (average for 12 months)		5.02%
2005 (average for 12 months)		4.62%
2006 (average for 12 months)		4.98%
2007 (average for 12 months)		4.87%
2008 (average - first 8 months)		4.52%
2008 (September 30)		4.43%
2008 (October 31)		4.78%
2008 (November 30)		3.72%
2008 (December 31)		3.03%
2009 (January 31)		3.86%
2009 (February 29)		3.98%
2009 (March 31)		3.61%
2009 (April 30)		4.10%

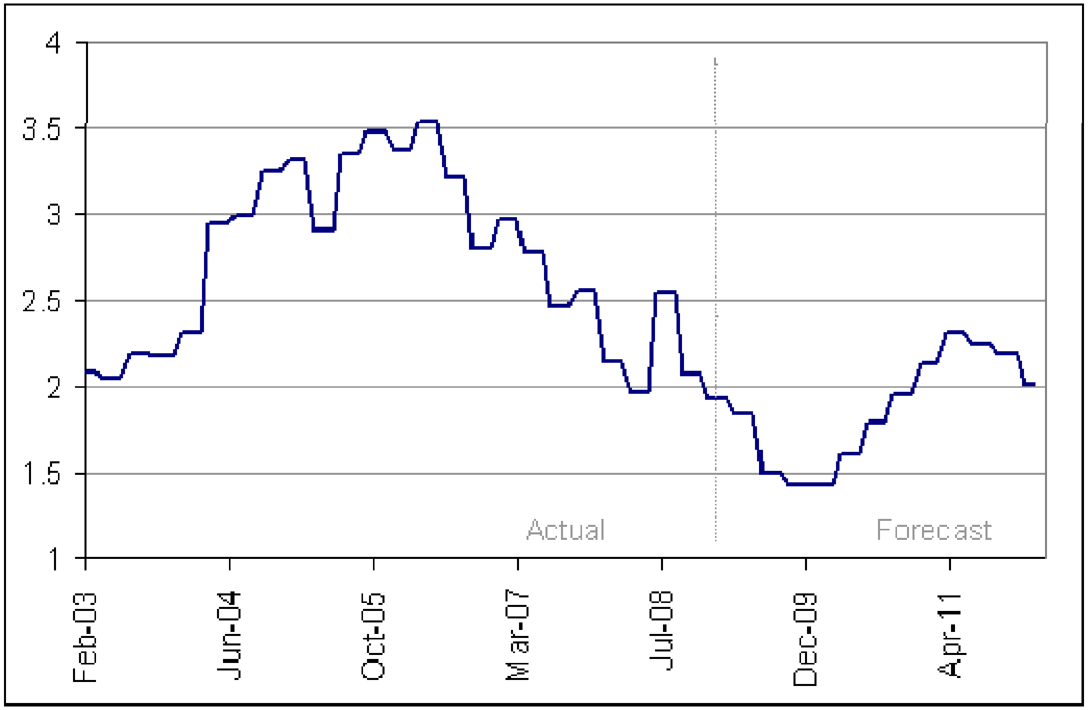
Implied Forward Volatility

Ticker:	SPY		TLT	
Description:	S&P 500 ETF		iShares Lehman 20+ Year Treasury Bond	
	Implied Volatility		Implied Volatility	
As of:	30 Day (1)	3 Mnth (2)	30 Day (1)	3 Mnth (2)
12/31/2007	21.525	22.604	14.952	14.356
1/31/2008	26.121	23.983	17.578	16.294
2/29/2008	24.581	24.925	17.807	17.305
3/31/2008	25.037	24.590	16.846	17.239
4/30/2008	19.403	19.977	12.954	13.341
5/31/2008	15.929	18.885	13.081	14.165
6/30/2008	22.804	22.508	11.516	12.966
7/31/2008	22.058	21.838	11.085	12.316
8/31/2008	19.111	21.246	10.759	12.133
9/30/2008	39.166	31.297	18.686	16.118
10/31/2008	52.078	46.356	16.809	18.464
11/30/2008	51.756	48.393	28.837	31.087
12/31/2008	36.267	37.567	31.332	31.213
1/31/2009	39.630	38.683	26.101	25.258
2/28/2009	40.919	39.475	25.140	25.410
3/31/2009	39.529	39.385	17.989	19.401
4/30/2009	33.320	33.163	19.808	19.875

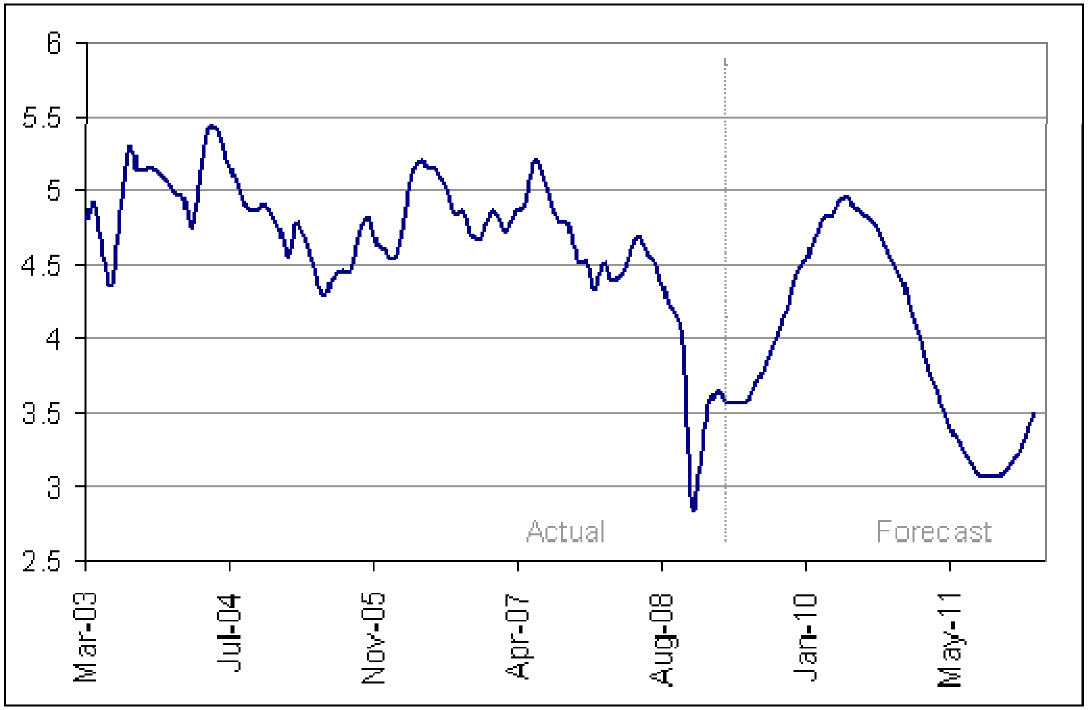
Notes:
(1) 30 Day Implied Volatility
(2) 3 month Implied Volatility

Source: Bloomberg

GDP Deflator Extended Forecast



30 Year Treasury Extended Forecast



Issues with estimating RP_m = Equity or Market Risk Premium

- The equity risk premium , the rate of return ***expected*** on a diversified portfolio of common stocks in excess of the rate of return on an investment in T-bonds, has likely increased as the broad stock market level has declined.
- Long-term study of realized premiums in excess of the return on T-bonds indicates that realized premiums, on the average, have decreased as the T-bond yields decrease. But these are not ordinary times. If one simply adds an estimate of the ERP derived during "normal" economic times to the "spot" yield on 20-year T-bonds on December 31, 2008, one will likely arrive at too low of an estimate of the cost of equity capital.

U.S. Historical Realized Risk Premiums in Excess of Long-Term Income Returns

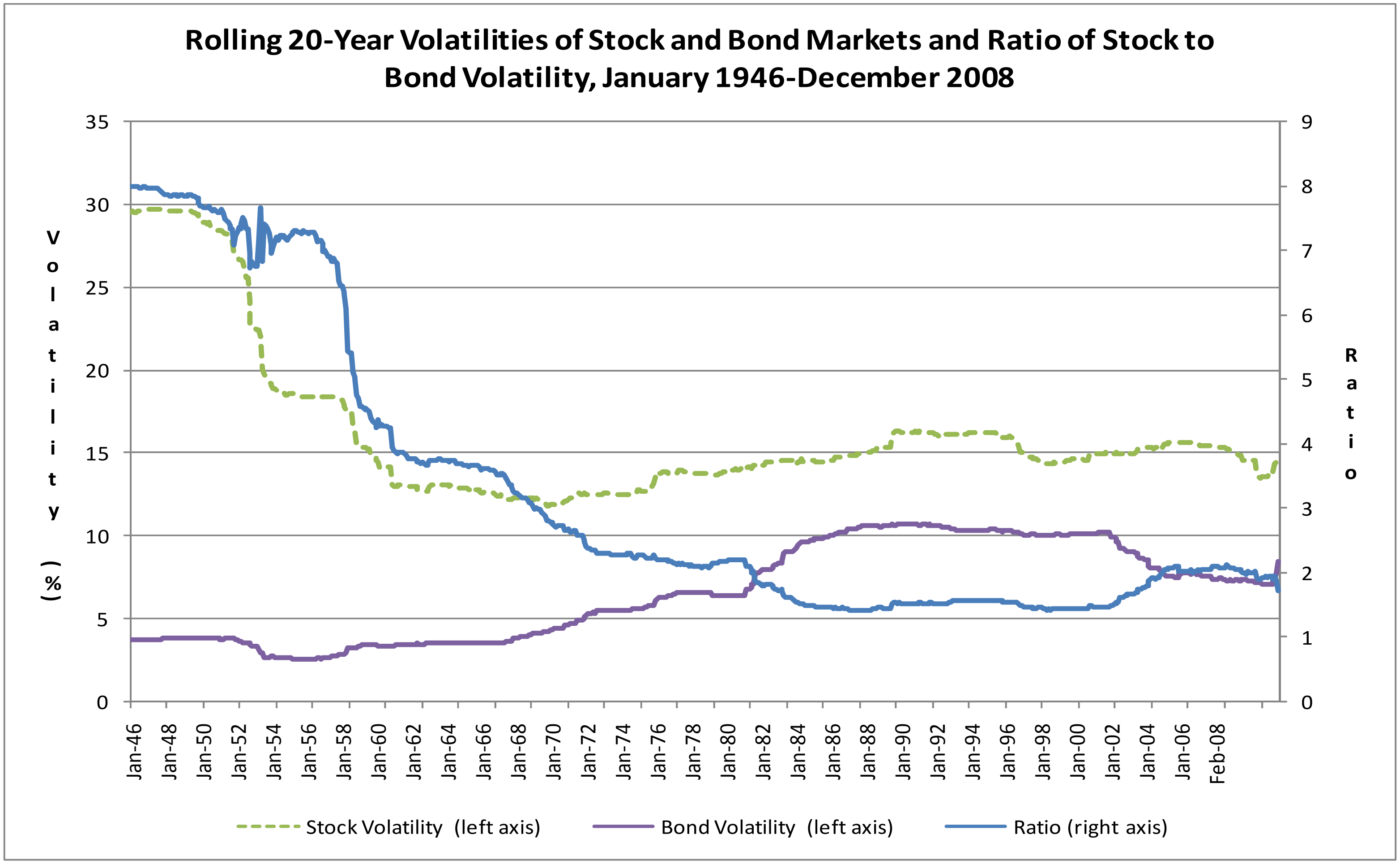
Period	Geometric Average	Arithmetic Average
20 years (1989-2008)	2.2%	4.1%
30 years (1979-2008)	3.4%	5.0%
40 years (1969-2008)	1.6%	3.2%
50 years (1959-2008)	2.4%	3.8%
83 years (1926-2008)	4.5%	6.5%
109 years (1900-2008)	4.3%	6.3%
137 years (1872-2008)	3.8%	5.6%
211 years (1798-2008)	3.3%	4.9%

Historical Realized Risk Premiums - Which period to use?

Asness, "Stocks versus Bonds: Explaining the Equity Risk Premium," *Financial Analysts Journal* (April/May 2000) (pp. 96-113).

- Displays evidence that relative volatility of stocks versus bonds is low today leading to lower expected stock returns compared to bond returns
- Figure 5 from original article is displayed with updated results through 2008 prepared by Duff & Phelps

Stocks vs. Bonds: Explaining Changes in the Equity Risk Premium



Historical Realized Risk Premiums – Which period to use?

Comparison of long-run US historical realized risk premiums:

	Realized Risk Premiums *		Volatility of		Ratio of Equity to Bond Return Volatility
Period	Geometric Avg	Arithmetic Avg	Bond Returns	Equity Returns	
1900 - 1925	5.1%	6.7%	2.6%	19.1%	7.3
1926 - 1955	7.5%	10.5%	4.7%	25.3%	5.4
1956 - 2008	2.7%	4.2%	11.0%	17.6%	1.6

Conclusion: Relative risk of stocks vs. bonds lower today indicating risk premium over long-term bonds lower today

*Premium over total returns on long-term government bonds

Historical Risk Premiums: What was expected based on underlying economics vs. what was realized? (cont'd)

Ibbotson and Chen, "The Supply of Stock Market Returns," working paper (March 2002); *Financial Analysts Journal (*Jan*.*/Feb. 2003).

- Theory:
  - Long-term company returns should follow changes in dividends and earnings
  - Remove changes in P/E ratios - remove changes in pricing expected not to continue in future (i.e., market P/E that increased in past not expected to continue to increase)

Historical Risk Premiums: What was expected based on underlying economics?

- *SBBI Valuation Edition Yearbook* reports updates to “supply side” estimate of equity risk premiums annually for U.S.
- Forthcoming *Ibbotson SBBI Supply Side Report* provides more details on supply-side arithmetic averages
  - Differences between arithmetic average of 1-year realized returns and supply-side estimates of equity premiums are as follows:

ERP Period	Historical Realized	Supply Side
1926–2008	6.5%	5.7%

Historical Risk Premiums: What was expected based on underlying economics? (cont'd)

Goetzmann and Ibbotson, "History and the Equity Risk Premium," Yale International Center for Finance Working Paper no. 05-04 (April 2005).

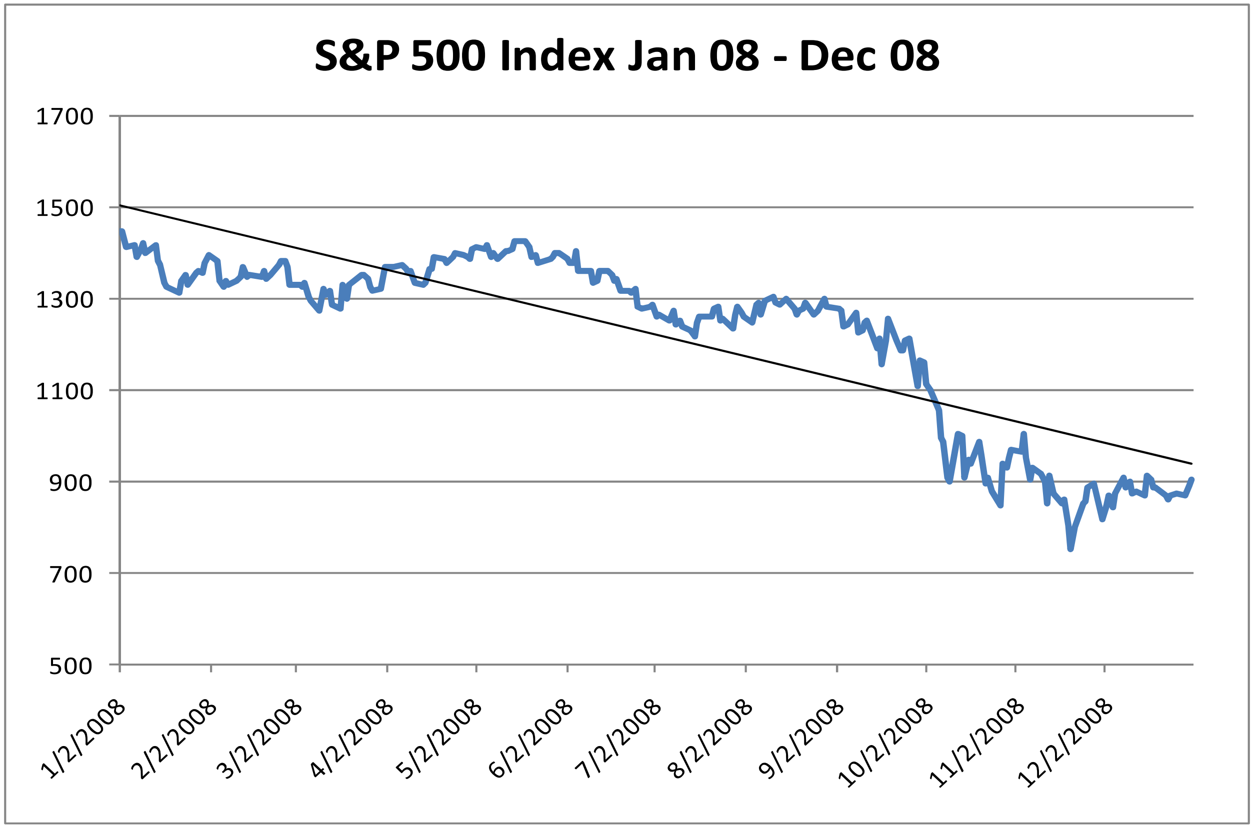
"These forecast tend to give somewhat lower forecasts than historical risk premiums, primarily because part of the total returns of the stock market have come from price-earnings ratio expansion. This expansion is not predicted to continue indefinitely, and should logically be removed from the expected risk premium." (p. 8)

Issues with estimating RP_m = Equity or Market Risk Premium

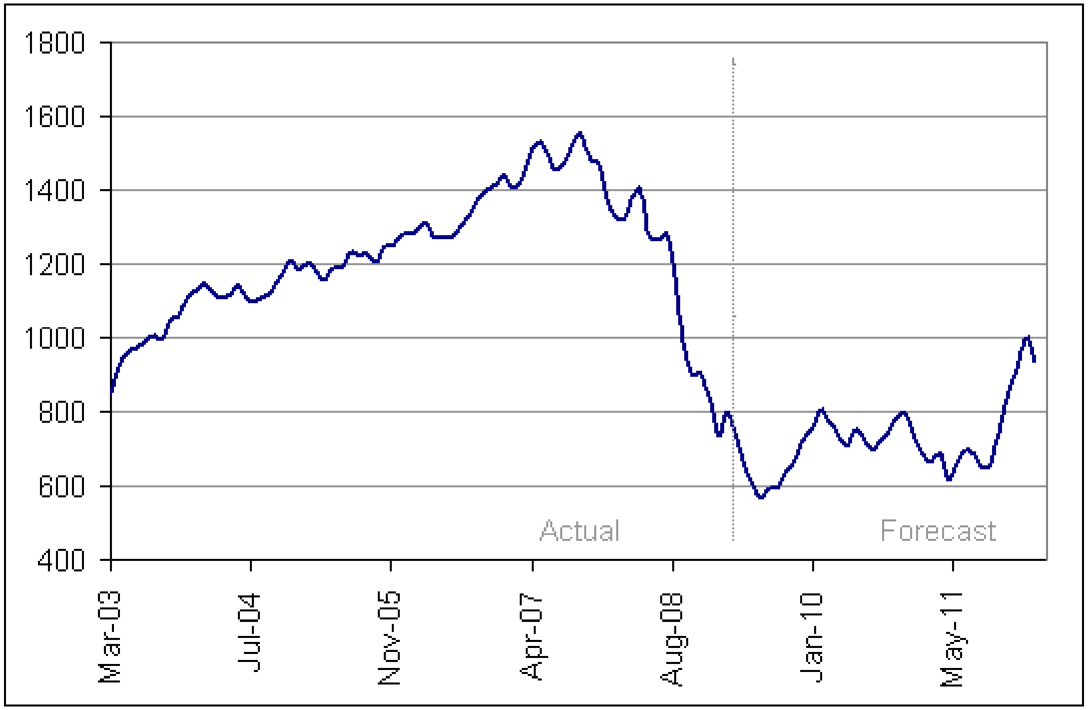
The evidence presented [that the long-run ERP is between 3.5% and 6%] represents a long-term average or unconditional estimate of the ERP. That is, what is a reasonable range of ERP that can be expected over an entire business cycle? Where in this range is the current ERP? Research has shown that ERP is cyclical during the business cycle. We use the term "conditional ERP" to mean the ERP that reflects current market conditions. For example, when the economy is near or in recession (and reflected in recent relatively low returns on stocks), the conditional ERP is more likely at the higher end of the range. When the economy improves (with expectations of improvements reflected in recent increasing stock returns), the conditional ERP moves toward the mid-point of the range. When the economy is near its peak (and reflected in recent relatively high stock returns), the conditional ERP is more likely at the lower end of the range.

Pratt and Grabowski, *Cost of Capital: Applications and Examples* 3rd ed, Chapter 9.

S&P 500 Index Throughout 2008



Standard & Poor's 500 Stock Index Extended Forecast



Forward-Looking Equity Risk Premiums: Approaches

- What do investors actually expect?
- "<u>Top down</u>" approach:
  - Ask people what they think the market is going to do
- "<u>Bottom up</u>" approach:
  - Gather expected returns for many individual companies
  - Take an average to get an expected return on "The Market"

Forward-Looking Equity Risk Premiums – "Bottom Up"

	12/31/08	5-yr Average
Merrill Lynch (1)	8.7%	6.8%
Merrill Lynch – Adjusted Risk Free Rate (2)	7.2%	6.5%
Value Line (3)	6.3%	6.2%

(1) Infinite horizon div discount model
Source: Merrill Lynch *Quantitative Profiles* (monthly)

(2) The December 2008 risk free was adjusted upward by 150 bps

(3) 3–5 yr horizon expected price change

Implied ERP estimates derived from Quantitative Profiles

	Implied ERP
1/31/2008	6.5%
2/29/2008	6.9%
4/30/2008	7.2%
5/31/2008	6.6%
6/30/2008	N/A
7/31/2008	6.9%
8/31/2008	6.8%
9/30/2008	7.0%
10/31/2008	7.3%
11/30/2008	7.4%
12/31/2008	8.7%
1/31/2009	9.2%
2/28/2009	8.5%

References

- Damodaran, "Equity Risk Premiums: Determinants, Estimation, and Implementation," working paper (Sept. 2008).
- *Equity Risk Premium Forum*, AIMR (Nov. 8, 2001)

  www.cfainstitute.org.
- Fernandez, "Equity Premium: Historical, Expected Required and Implied", working paper (Feb. 18, 2007).
- Shannon Pratt and Roger Grabowski, *Cost of Capital: Applications and Examples*, 3rd ed. (John Wiley & Sons, March 2008).

Issues with estimating β = "Beta" measured with respect to a market index

- Beta is a forward concept just as is ERP. We typically use regressions of historic returns over a look-back period to estimate beta.
- Because the stock market correction has been heavily concentrated in the financial services sector and in highly leveraged companies, the commonly-employed methods we use for estimating betas, the risk measure in the traditional CAPM, are potentially flawed providing faulty estimates of risk. The result is that at the very time when one assumes *a priori* that estimates of cost of equity capital have increased, the methods we traditionally use to estimate the cost of equity capital are providing calculations that imply risk has declined.
- Data sources typically use one method of estimating beta over a standard look-back period

Issues with estimating β = "Beta" measured with respect to a market index

- Current decline in market capitalization has turned many highly leveraged companies into small cap companies
- Using OLS methodology, observed betas of small companies (where size is measured by market value) often too low compared to betas for large companies

Ibbotson, Kaplan and Peterson, "Estimates of Small Stock Betas are Much too Low," *Journal of Portfolio Management* (Summer 1997) (free copy can be downloaded from www.morningstar.com)

$$(R_s - R_f) = \propto_s + \beta_{so} \times (R_{mo} - R_{fo}) + \beta_{s-1} \times (R_{m-1} - R_{f-1}) + \varepsilon_t$$

$$Sum\beta eta = \beta_{so} + \beta_{s-1}$$

- *Cost of Capital 3rd* ed provides *Excel* routines for calculating ***Sumβeta***

Is there a difference in beta estimates: OLS Betas vs. SumBetas (recent)?

CRSP Cap-Based Indices:

60-months Ending December 2006

Decile	Largest	OLS Beta	Sum Beta	Difference
1	$ 398,907	0.96	0.95	-0.01
2	17,292	0.96	1.11	0.15
3	7,913	1.09	1.31	0.22
4	4,221	1.08	1.40	0.32
5	2,812	1.08	1.39	0.31
6	1,985	1.15	1.46	0.31
7	1,343	1.23	1.64	0.41
8	956	1.26	1.75	0.48
9	639	1.29	1.84	0.54
10	321	1.17	1.70	0.53
Mid-Cap 3-5	7,913	1.08	1.36	0.27
Low-Cap 6-8	1,985	1.21	1.59	0.39
Micro-Cap 9-10	639	1.24	1.79	0.54

Not much difference for larger companies

Difference is material for smaller companies

Issues with estimating β = "Beta" measured with respect to a market index

Many divisions are largest companies in industry, making "pure play" beta estimation difficult (e.g., 75% of revenue from single SIC code)

Kaplan and Peterson, "Full Information Betas," *Financial Management* (Summer, 1998).

1. Calculated beta for each company and weighting of each to industry (sales, assets or other)
2. Cross sectional regression with betas as dependant variable and weighting as independent variable
3. Weighted by market capitalization of companies in industry

Full information beta in Morningstar *Beta Book*

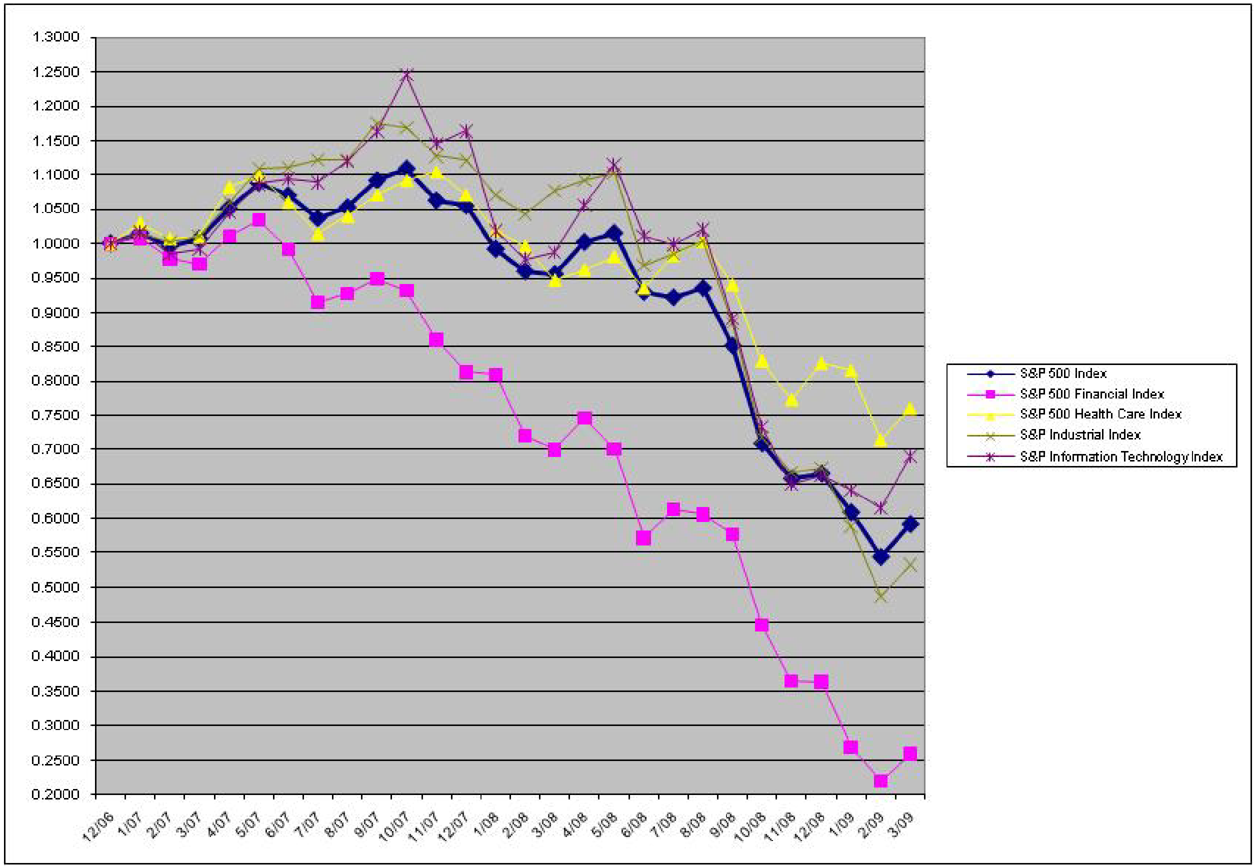
- weighted by sales – easy to obtain data
- Problem: Market weights profit not sales; can overweight relative importance of high-sales, low-profit businesses

- *Cost of Capital 3rd* ed provides *Excel* routines for calculating full information betas where user can base weighting on sales, operating income or assets and use either OLS or ***Sumβetas***

Beta Estimates for Non-Financial Sector Sample Company with Long-Term Debt

As of	60 Month OLS Beta	R^2 (60 Month OLS Beta)	Total Beta (60 Month OLS Beta)	260 Week OLS Beta	R^2 (260 Week OLS Beta)	Total Beta (260 Week OLS Beta)	Projected Barra Beta	60 Month Sum Beta from Research Insight	R^2 (Sum Beta)	Total Beta (Sum Beta)
3/30/2009	1.119	0.220	2.386	1.266	0.370	2.081	1.271	1.36	0.24	2.776
2/28/2009	1.068	0.193	2.431	1.243	0.338	2.138	1.302	1.38	0.22	2.942
1/31/2009	0.972	0.150	2.510	1.236	0.322	2.178	1.222	1.29	0.18	3.041
12/30/2008	1.248	0.235	2.574	1.280	0.339	2.198	1.343	1.50	0.26	2.942
11/30/2008	1.204	0.262	2.352	1.310	0.388	2.103	1.371	1.66	0.34	2.847
10/30/2008	0.966	0.127	2.711	1.395	0.370	2.293	1.185	1.35	0.24	2.756
9/30/2008	0.800	0.102	2.505	1.135	0.202	2.525	0.923	1.11	0.12	3.204
8/30/2008	0.875	0.063	3.486	1.167	0.210	2.547	0.962	1.21	0.12	3.493
7/30/2008	0.851	0.060	3.474	1.109	0.190	2.544	0.936	1.20	0.12	3.464
6/30/2008	0.890	0.104	2.760	1.060	0.185	2.464	0.963	1.28	0.12	3.695
5/30/2008	0.961	0.090	3.203	1.072	0.178	2.541	0.952	1.49	0.13	4.133
4/30/2008	1.165	0.124	3.308	1.087	0.179	2.569	1.025	1.85	0.19	4.244
3/30/2008	1.135	0.086	3.870	1.045	0.166	2.565	0.964	1.82	0.20	4.070
2/29/2008	1.140	0.128	3.186	1.128	0.198	2.535	0.949	1.94	0.21	4.233
1/30/2008	1.174	0.087	3.980	1.158	0.199	2.596	0.985	2.11	0.23	4.400
12/30/2007	1.437	0.119	4.166	1.238	0.220	2.639	1.169	2.24	0.26	4.393
11/30/2007	1.208	0.095	3.919	1.236	0.222	2.623	1.026	2.21	0.25	4.420
10/30/2007	1.274	0.103	3.970	1.229	0.217	2.638	1.071	2.13	0.26	4.177
9/30/2007	1.403	0.196	3.169	1.195	0.214	2.583	1.097	2.06	0.25	4.120
8/30/2007	0.895	0.071	3.359	1.078	0.176	2.570	1.127	1.48	0.14	3.955
7/30/2007	0.897	0.071	3.366	1.062	0.175	2.539	1.175	1.44	0.14	3.849
6/30/2007	0.694	0.048	3.168	1.047	0.182	2.454	1.116	1.03	0.09	3.433
5/30/2007	0.570	0.035	3.047	1.017	0.166	2.496	1.190	0.90	0.07	3.402
4/30/2007	0.550	0.047	2.537	0.979	0.159	2.455	1.299	0.76	0.06	3.103
3/30/2007	0.491	0.027	2.988	0.945	0.151	2.432	1.390	0.74	0.05	3.309
2/28/2007	0.563	0.053	2.446	0.904	0.135	2.460	1.347	0.72	0.06	2.939
1/30/2007	0.506	0.029	2.971	0.874	0.127	2.453	1.316	0.69	0.05	3.086
12/30/2006	0.534	0.049	2.412	0.872	0.128	2.437	1.389	0.69	0.05	3.086

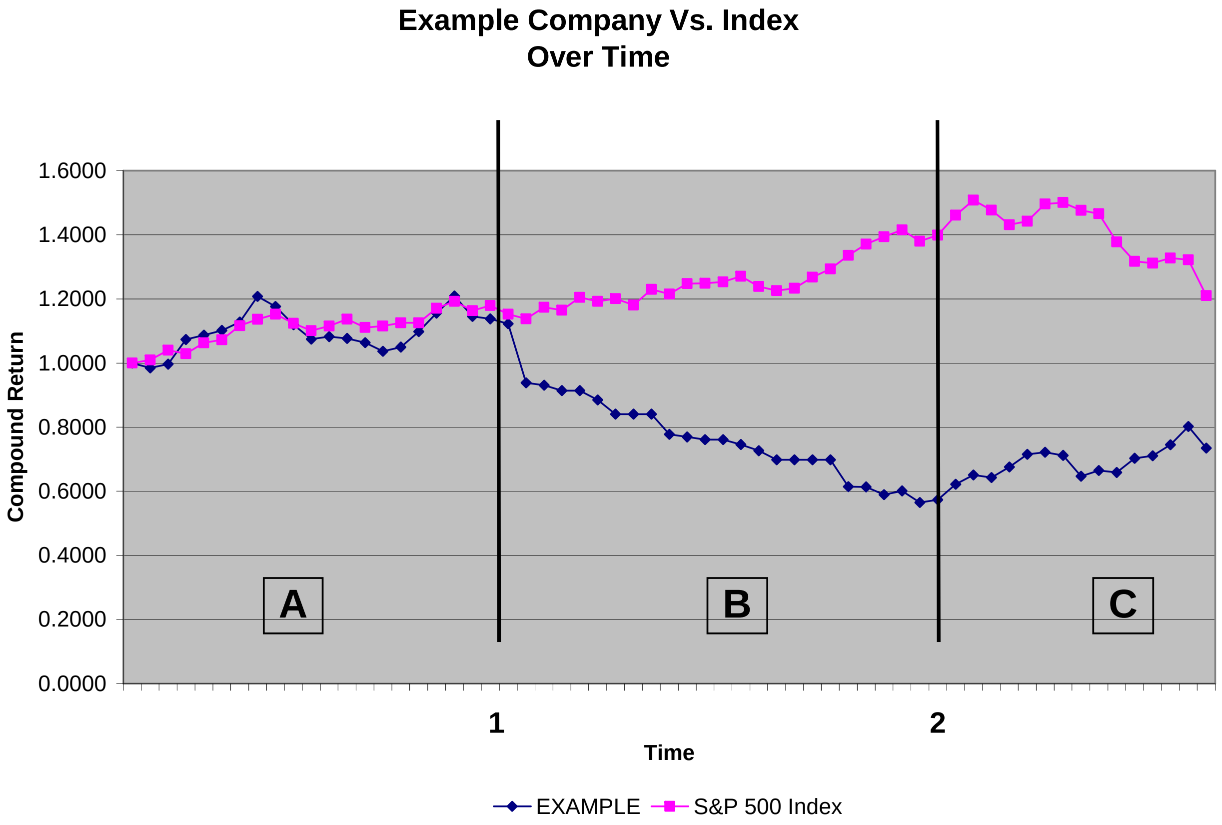
Return on Various S&P Indices Over Time



Issues with estimating β: using returns during look-back period when relationship to market is changing

- While such adjustments in pricing occur for some stocks during all time periods, over these past few months we have seen the stock market (as represented by the *S&P 500* for example) experience a major re-pricing led by financial sector stocks and highly leveraged non-financial stocks. Stocks of companies with traditionally high operating leverage (operating income and prices moving up faster than the overall market during upward market price movements, and moving down faster than the market when the market declines) appear to indicate that operating leverage has decreased when in fact their underlying operating leverage has not changed.
- Looking at example on next slide. In period A, the sample company essentially moves with the market. In period B, the sample company is experiencing a downward re-pricing, and during this period the sample company's returns are not as strongly correlated with the movement of the overall market. In Period C, the re-pricing of the sample company is complete, and the sample company's returns are once again moving in tandem with market returns.

Pricing Adjustment for a Hypothetical Company



Issues with estimating β: using returns during look - back period when relationship to market is changing

- If one were to compute beta at Time 1, which includes period "A" as the "look-back" period, the beta estimate would reflect the normal relationship between the sample company's returns in the market's returns. In contrast, computing a beta estimate at Time 2, which includes period "B" (the sample company's re-pricing by the market) as the "look-back" period, would not yield a reliable forward-looking beta estimate. In fact, it would yield a beta estimate lower than expected since the sample company's return was negative in a period when the market was generally rising. This result is counter-intuitive given the sample company's downward re-pricing, i.e., the operating risk of the sample company has not declined over period "B" and will resume its "normal" relationship to the market in period "C."

Beta Estimates for Sample Company with No Long-Term Debt

As of	60 Month OLS Beta	R^2 (60 Month OLS Beta)	Total Beta (60 Month OLS Beta)	260 Week OLS Beta	R^2 (260 Week OLS Beta)	Total Beta (260 Week OLS Beta)	Projected Barra Beta	60 Month Sum Beta from Research Insight	R^2 (Sum Beta)	Total Beta (Sum Beta)
3/31/2009	1.124	0.209	2.459	0.907	0.210	1.979	1.042	1.16	0.21	2.531
2/28/2009	1.072	0.183	2.506	0.942	0.205	2.081	1.085	1.17	0.19	2.684
1/30/2009	1.131	0.181	2.658	0.945	0.196	2.135	1.107	1.25	0.18	2.946
12/30/2008	1.317	0.212	2.860	0.961	0.188	2.216	1.265	1.29	0.26	2.530
11/30/2008	1.299	0.242	2.641	0.937	0.183	2.190	1.014	1.15	0.23	2.398
10/30/2008	1.284	0.226	2.701	0.873	0.131	2.412	0.984	1.14	0.23	2.377
9/30/2008	1.801	0.283	3.385	1.143	0.139	3.066	1.137	1.75	0.28	3.307
8/30/2008	1.771	0.241	3.608	1.115	0.135	3.035	1.210	1.73	0.24	3.531
7/30/2008	1.740	0.247	3.501	1.097	0.131	3.031	1.091	1.74	0.25	3.480
6/30/2008	1.779	0.242	3.616	1.120	0.140	2.993	1.206	1.76	0.24	3.593
5/30/2008	2.113	0.274	4.037	1.124	0.137	3.037	1.259	2.12	0.27	4.080
4/30/2008	2.323	0.312	4.159	1.163	0.141	3.097	1.360	2.50	0.31	4.490
3/30/2008	2.479	0.371	4.070	1.252	0.160	3.130	1.301	2.60	0.37	4.274
2/29/2008	2.492	0.349	4.218	1.095	0.131	3.025	1.341	2.77	0.35	4.682
1/30/2008	2.482	0.340	4.257	1.186	0.142	3.147	1.298	2.78	0.35	4.699
12/30/2007	2.348	0.272	4.502	1.105	0.122	3.164	1.336	2.28	0.27	4.388
11/30/2007	2.460	0.326	4.309	1.132	0.128	3.164	1.330	2.54	0.32	4.490
10/30/2007	2.450	0.322	4.318	1.174	0.130	3.256	1.384	2.54	0.32	4.490
9/30/2007	2.842	0.399	4.499	1.433	0.201	3.196	1.540	2.44	0.41	3.811
8/30/2007	2.930	0.500	4.144	1.526	0.232	3.168	1.334	2.56	0.51	3.585
7/30/2007	2.944	0.492	4.197	1.496	0.223	3.168	1.404	2.79	0.49	3.986
6/30/2007	2.707	0.460	3.991	1.414	0.208	3.100	1.408	2.40	0.47	3.501
5/30/2007	2.945	0.515	4.104	1.516	0.214	3.277	1.422	2.62	0.52	3.633
4/30/2007	3.007	0.533	4.119	1.512	0.218	3.238	1.326	2.80	0.53	3.846
3/30/2007	3.057	0.559	4.089	1.577	0.232	3.274	1.489	2.86	0.56	3.822
2/28/2007	3.011	0.550	4.060	1.578	0.227	3.312	1.392	2.85	0.55	3.843
1/30/2007	3.099	0.540	4.217	1.592	0.215	3.433	1.512	3.00	0.54	4.082
12/30/2006	3.072	0.535	4.200	1.598	0.214	3.454	1.465	2.97	0.53	4.080

Formulas for unlevering and relevering betas – theory vs. current practice

Theory:

- Company risk comprised of operating risk and financial risk (leverage)
- More leverage means more risk (higher beta)

Problem:

- Publicly traded guideline or comparable companies may have leverage that differs from our subject company

Solution:

- "Unlever" the guideline or comparable companies betas
  - Removing the effect of financial leverage leaves the effect of operating risk only – unlevered beta often termed "asset beta".
- "Relever" estimated unlevered beta to reflect leverage of subject company

Beta Measurement - Levered vs. Unlevered Betas

Basic relationship underlying formulas for unlevering/relevering beta:

Value of a Levered Firm

Assets	**Capital**
Value of Unlevered Firm	**Value of Debt Capital**
plus	**plus**
Value of Tax Shield	**Value of Equity Capital**

- **In this formulation, the cost of debt capital is measured prior to the tax affect because the value of the tax deduction on the interest payments equals the value of the tax shield.**

Beta Measurement - Levered/Unlevered/Relevered Formulae

Hamada, "The Effect of the Firm's Capital Structure on the Systematic Risk of Common Stocks," *Journal of Finance* 27(2) (1972).

$$B_u = \frac{B_L}{1 + (1 - t)W_d / W_e}$$

$$B_L = B_u (1 + (1 - t)W_d / W_e)$$

Beta Measurement -Levered/Unlevered/Relevered Formulae

The Hamada formulas are consistent with theory that:

- Discount rate used to calculate the tax shield equals the cost of debt capital (i.e., the tax shield has same risk as debt).
- Debt capital has negligible risk that interest payments and principal repayments will not be made when owed which infers tax deductions on the interest expense will be realized in the period in which the interest is paid (i.e., beta of debt capital equals zero).
- Value of the tax shield is proportionate to the value of the market value of debt capital (i.e., value of tax shield $= t \times W_d$).
- *But the Hamada formulas are based upon Modigliani and Miller's formulation of the tax shield values for constant debt.* ***The formula is not correct if the assumption is that debt capital remains at a constant percentage of equity capital (equivalent to debt increasing in proportion to net cash flow to the firm in every period).****[1] The formulas are often wrongly assumed to hold in general.*

  [1] Arzac, Enrique R., and Lawrence R. Glosten. "A Reconsideration of Tax Shield Valuation." European Financial Management (2005): 453-461.

Beta Measurement - Levered/Unlevered/Relevered Formulae

Miles and Ezzell, "The Weighted Average Cost of Capital, Perfect Capital Markets, and Project Life: a Clarification," *Journal of Financial and Quantitative Analysis* (Sept 1980) pp 719-730.

- Introduces beta for debt capital

$$B_U = \frac{M_e \times B_L + M_d \times B_d \left[1 - (t \times k_{d(pt)})/(1 + k_{d(pt)})\right]}{M_e + M_d \left[1 - (t \times k_{d(pt)})/(1 + k_{d(pt)})\right]}$$

$$B_L = B_U + \frac{W_d}{W_e}(B_U - B_d)\left[1 - \frac{(t \times k_{d(pt)})}{(1 + k_{d(pt)})}\right]$$

Beta Measurement - Levered/Unlevered/Relevered Formulae

The Miles -Ezzell formulas are consistent with the theory that:

- Discount rate used to calculate the tax shield equals the cost of debt capital (i.e., the tax shield has same risk as debt) during the first year and the discount rate used to calculate the tax shield thereafter equals the cost of equity calculated using the asset beta of the firm (i.e., the risk of the tax shield after the first year is comparable to the risk of the operating cash flows). That is, the risk of realizing the tax deductions is greater than assumed in the Hamada formulas.
- Debt capital is bearing risk of variability of operating net cash flow in that interest payments and principal repayments may not be made when owed which infers tax deductions on the interest expense may not be realized in the period in which the interest is paid (i.e., beta of debt capital may be greater than zero).
- Market value of debt capital remains at a constant percentage of equity capital which is equivalent that debt increases in proportion to the net cash flow of the firm (net cash flow to invested capital) in every period.

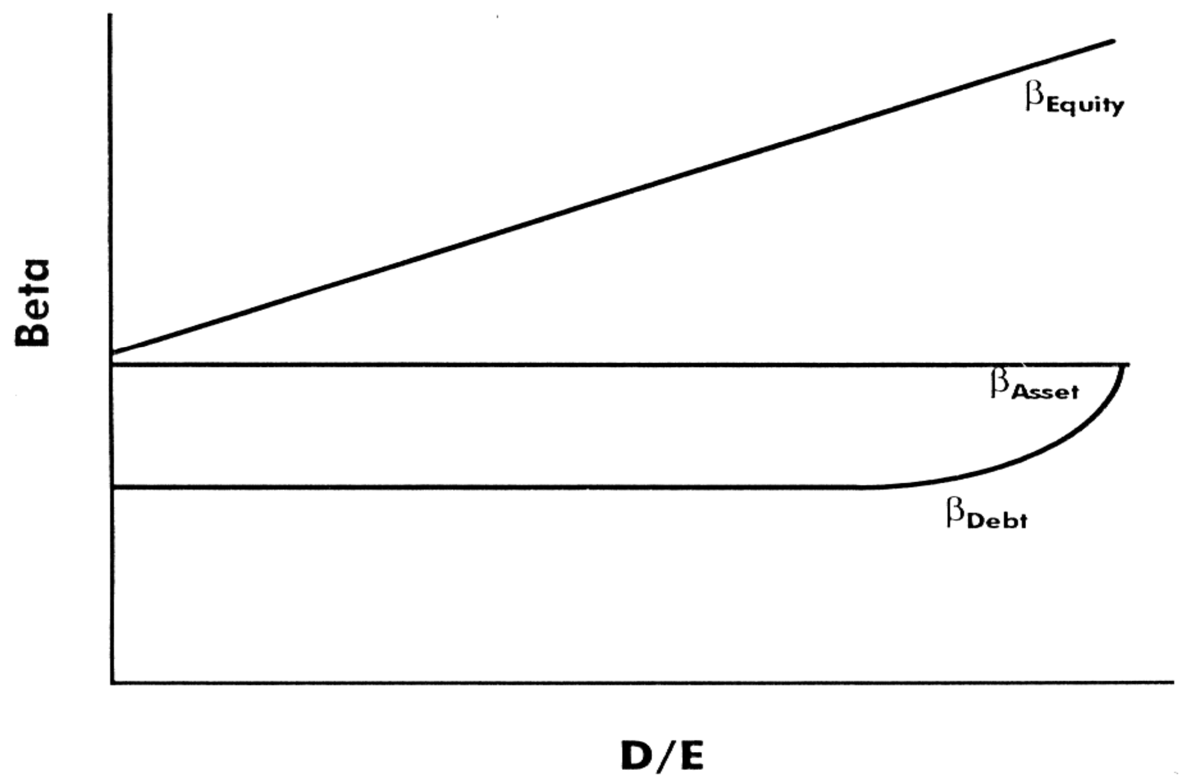
Debt Betas by Bond Rating

	December 2008	March 2009
Aaa	0.12	0.26
Aa	0.17	0.20
A	0.35	0.32
Baa	0.42	0.34
Ba	0.68	0.47
B	0.77	0.53
Caa	1.11	0.88
Ca-D	1.50	1.31

Beta Measurement - Levered/Unlevered/Relevered Formulae

- The affect of increasing debt levels is that the cost of equity capital likely is understated by using any of the traditional un-levering formulas. All of the formulas define linear relationships. Research indicates that the correct relationship is not linear as leverage increases; rather the COEC increases at an increasing (or exponential) rate as leverage increases.
- The following graph displays the likely market relationship of debt and equity betas as the level of debt increases. In this market, leverage is increasing just because stock market capitalizations are decreasing.

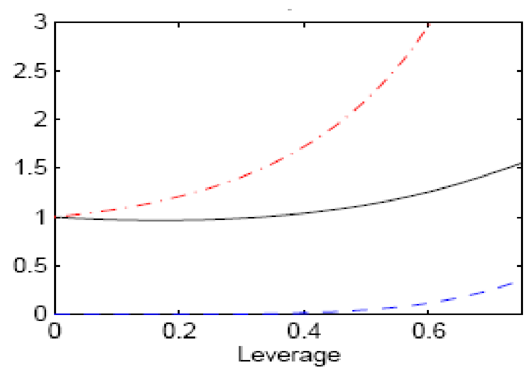
Traditional relationship Between Levered Equity Beta and Unlevered Asset Beta imbedded in formulas



Beta as a Function of Leverage

*(*Exhibit 14.5 *Cost of Capital 3rd ed)*

The real world is more complicated than the textbook models. This figure depicts the relation between leverage and the beta of a firm's debt, equity, and the weighted average beta with tax benefits and costs of financial distress. Leverage is defined as the market value of debt divided by the total market value of the firm. is the beta of the company's debt and is the beta of the firm's equity. The unlevered asset beta is assumed equal to 1.



Weighted average beta of equity and debt

B_d

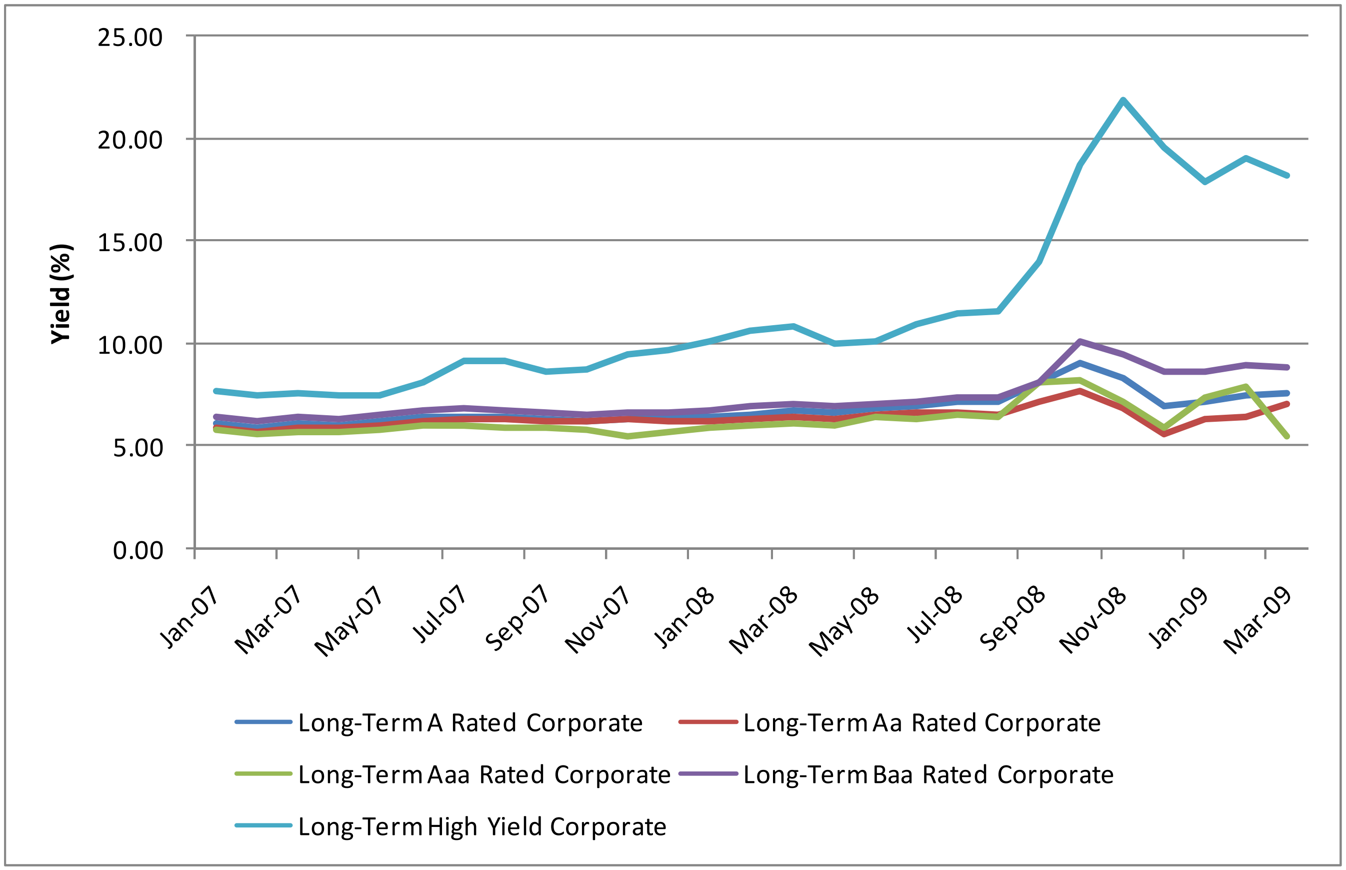
B_e

Source: Arthur G. Korteweg, "The Costs of Financial Distress across Industries," Working paper Stanford University (January 15, 2007): 65. Used with permission. All rights reserved. 06 From Shannon Pratt and Roger Grabowski, *Cost of Capital: Applications and Examples, 3rd ed.* (John Wiley & Sons, March 2008). Used with permission. All Rights Reserved.

Yields on Government and Corporate Bonds: Spreads over Aaa have increased

	Yields							
	20 Year Gov T-Bond	IT Gov T-Bond	30 Day T-Bill	Long-Term A Rated Corporate	Long-Term Aa Rated Corporate	Long-Term Aaa Rated Corporate	Long-Term Baa Rated Corporate	Long-Term High Yield Corporate
Jan-07	5.02	4.79	0.44	6.14	5.90	5.78	6.47	7.61
Feb-07	4.77	4.48	0.38	5.90	5.72	5.57	6.23	7.45
Mar-07	4.93	4.51	0.43	6.11	5.96	5.73	6.44	7.59
Apr-07	4.89	4.49	0.44	6.04	5.92	5.67	6.35	7.47
May-07	5.10	4.83	0.41	6.24	6.09	5.84	6.54	7.48
Jun-07	5.21	4.90	0.40	6.40	6.26	6.01	6.74	8.10
Jul-07	5.01	4.57	0.40	6.43	6.35	5.96	6.83	9.08
Aug-07	4.87	4.20	0.42	6.42	6.34	5.91	6.74	9.08
Sep-07	4.89	4.13	0.32	6.37	6.29	5.88	6.70	8.64
Oct-07	4.80	4.35	0.32	6.25	6.28	5.75	6.55	8.72
Nov-07	4.45	3.33	0.34	6.30	6.33	5.49	6.61	9.48
Dec-07	4.50	3.28	0.27	6.39	6.26	5.70	6.64	9.64
Jan-08	4.36	3.01	0.21	6.45	6.23	5.86	6.80	10.04
Feb-08	4.38	2.56	0.13	6.53	6.36	5.97	6.96	10.58
Mar-08	4.32	2.45	0.17	6.73	6.50	6.08	7.11	10.86
Apr-08	4.58	3.16	0.18	6.59	6.38	6.05	6.96	10.02
May-08	4.75	3.40	0.18	6.85	6.61	6.43	7.08	10.06
Jun-08	4.60	3.30	0.17	6.97	6.67	6.36	7.18	10.89
Jul-08	4.65	3.22	0.15	7.20	6.71	6.51	7.38	11.43
Aug-08	4.49	3.03	0.13	7.15	6.58	6.45	7.35	11.56
Sep-08	4.43	2.89	0.15	8.06	7.26	8.04	8.19	13.91
Oct-08	4.78	2.60	0.08	9.04	7.75	8.18	10.16	18.67
Nov-08	3.72	1.61	0.03	8.34	6.93	7.16	9.54	21.83
Dec-08	3.03	1.26	0.00	6.95	5.61	5.86	8.62	19.50
Jan-09	3.94	1.82	0.00	7.20	6.32	7.31	8.69	17.87
Feb-09	4.01	2.02	0.01	7.49	6.50	7.85	9.03	19.04
Mar-09	3.55	1.68	0.02	7.62	7.10	5.51	8.90	18.12

Corporate Bond Yields



Example: Analysis of Gaming Companies - Capitalization

As of February 28, 2009	Mkt Value Equity	Debt: Book Value	Debt: Market Value	Debt: Beta	Equity Beta: Levered	Equity Beta: Unlevered	Pre-Tax Cost of Debt at Mkt
Ameristar Casinos, Inc.	$519.00	$ 1,648.50	$ 1,434.34	0.36	2.01	0.81	13.46%
Isle of Capri Casinos, Inc.	96.80	1,497.00	1,030.80	0.56	1.93	0.69	16.27%
MTR Gaming Group, Inc.	40.70	377.60	312.61	0.55	1.79	0.70	17.08%
Pinnacle Entertainment, Inc.	428.20	943.40	774.15	0.56	1.57	0.93	15.14%
Rivera Holdings Corp.	35.90	244.70	123.62	0.86	2.59	1.27	17.08%
Monarch Casino & Resort, Inc.	155.00	50.00	50.00	0.36	1.77	1.43	13.46%
Dover Downs Gaming & ENTMT	108.30	108.30	100.33	0.36	1.97	1.18	13.46%

Example: Analysis of Debt Capacity Implied by Current Market Values

			D/EBITDA		D/EBITDA	
As of February 28, 2009	**LTM EBITDA**	**2009 EST. EBITDA**	**Book**	**MKT**	**LTM**	**EST. 2009**
Ameristar Casinos, Inc.	$287.10	338.20	3.18	2.76	5.0	4.2
Isle of Capri Casinos, Inc.	182.10	199.6	15.5	10.6	5.7	5.2
MTR Gaming Group, Inc.	71.00	67.2	9.8	7.7	4.4	4.7
Pinnacle Entertainment, Inc.	154.00	219.9	2.2	1.8	5.0	3.5
Rivera Holdings Corp.	26.30	N/A	6.8	3.4	4.7	N/A
Monarch Casino & Resort, Inc.	24.50	26.1	0.32	0.32	2.0	1.9
Dover Downs Gaming & ENTMT	47.40	46.2	1.0	1.0	2.3	2.3

Cost of Capital of Small Gaming Company

Cost of Equity Capital: 4.5% + [2.0 x 6] + 5.88 = 27.4%

30% Equity/70% Debt

Pre-tax Estimate of Debt: 17.0%

WACC issues for subject company:

What is debt capacity?

What is present value of tax shield?

Weighted Average Cost of Capital

$WACC_t = k_{eut} – \{TS_t / [M_{dt-1} + M_{et-1}]\} – \{(k_{eut} - k_{TS}) (PV_{TSt-1} / [M_{dt-1} + M_{et-1}]\}$

where:

- k_{eut} = cost of equity capital, un-levered (assuming firm financed with all equity) at time = t
- TS_t = Tax shield realized at time = t
- M_{dt-1} = Market value of debt capital at time = $t – 1$
- M_{et-1} = Market value of equity capital at time = $t – 1$
- k_{TS} = Discount rate on tax shield based on the risk of realizing the tax shield (typically either , the pre-tax cost of debt, or k_{eu})
- PV_{TSt-1}= Present value of the tax shield as of time = $t-1$

Weighted Average Cost of Capital (Cont'd)

- If we assume that $k_{TS} = k_{eut}$ (the variability of one realizing the tax shield is approximately equal to the variability of cash flows of the business before interest expense) then the above formula simplifies to:

$$WACC_t = k_{eut} - \{TS_t / [\ M_{dt-1} + M_{et-1}\ ]\}$$

Distressed Companies

- **Financial Distress**: A company whose equity and debt values reflect the potential or probability of default or liquidation scenarios is considered to be operating under Financial Distress. Financial Distress is typically a result of a high debt burden, coupled with difficulties is accessing capital markets. The equity and debt market values should reflect analyst's views and weighting of going concern and default scenarios. Default scenarios could include, for example, the inability to pay current interest expense obligations, or inability to refinance current debt obligations resulting in the need to sell a portion of operating assets. Rating downgrades, non-investment grade debt or high market yields on debt are all indicators that the market is weighing the potential impact of distress scenarios. A company does not need to be in or near bankruptcy to be considered under financial distress. Financial Distress can also lead to Operational Distress.

Distressed Companies

- **Operational Distress**: Operational Distress will typically occur in periods of significant economic downturn. Financial Distress can also lead to Operational Distress. Other non- recurring events may also lead to Operational Distress, such as the loss of a major lawsuit, or a regulatory injunction, for example. While this is not an exhaustive list, the presence of some of the following situations may be indicators of Operational Distress:
  - The company is unable to pay its suppliers on a timely basis, leading potentially to supply shortages or disruptions;
  - The refusal by certain suppliers to service the company, again causing supply disruptions;
  - Manufacturing facilities operating at a significantly low level of capacity utilization;
  - High employee turnover, leading to operational disruptions; or
  - The loss of key customers due to concerns of supply reliability, both in terms of quality and delivery times.

Duff & Phelps' Risk Premium Report

- Provides data on realized equity returns in excess of the returns predicted by CAPM for "High Financial Risk" companies. This premium can be added to the standard CAPM estimate of the increase in the cost of equity capital for the market's estimate of the cost of distress (economic and financial distress).
- Criteria for assignment to the high financial risk portfolio are:
  (1) companies in bankruptcy or liquidation;
  (2) companies with the 5-year average net income or operating income in the prior 5-years less than zero;
  (3) companies with negative book value of equity at any of the prior 5 fiscal year ends; or
  (4) companies with book value of debt to market value of equity greater than 80%.

Duff & Phelps' Risk Premium Report – size measure by market value of equity

Companies Ranked by Market Value of Equity **Exhibit A-1**

Historical Equity Risk Premium: Average Since 1963
Data for Year Ending December 31, 2008

Portfolio Rank by Size	Average Mkt Value ($mils.)	Log of Average Mkt Value	Number as of 2008	Beta (SumBeta) Since '63	Standard Deviation of Returns	Geometric Average Return	Arithmetic Average Return	Arithmetic Average Risk Premium	*Smoothed Average Risk Premium*	Average Debt/ MVIC
1	127,995	5.11	40	0.86	16.92%	9.63%	10.97%	3.93%	*1.51%*	14.76%
2	36,587	4.56	34	0.92	16.81%	9.92%	11.25%	4.21%	*3.44%*	21.09%
3	21,569	4.33	35	0.97	16.96%	8.75%	10.11%	3.07%	*4.25%*	22.87%
4	16,126	4.21	35	0.98	17.47%	10.18%	11.63%	4.59%	*4.70%*	23.85%
5	12,369	4.09	36	0.97	16.77%	9.99%	11.34%	4.30%	*5.11%*	24.47%
6	9,399	3.97	41	1.04	17.39%	11.19%	12.60%	5.56%	*5.53%*	24.37%
7	7,150	3.85	37	1.03	18.68%	11.72%	13.32%	6.28%	*5.95%*	25.13%
8	5,597	3.75	40	1.04	18.29%	10.88%	12.43%	5.39%	*6.33%*	24.03%
9	4,775	3.68	41	1.11	19.94%	12.30%	14.12%	7.08%	*6.57%*	23.52%
10	3,948	3.60	43	1.07	18.62%	11.17%	12.76%	5.72%	*6.86%*	24.40%
11	3,418	3.53	44	1.15	21.59%	12.69%	14.87%	7.83%	*7.08%*	22.99%
12	2,933	3.47	37	1.12	18.97%	11.06%	12.76%	5.72%	*7.32%*	24.08%
13	2,675	3.43	40	1.09	20.18%	11.88%	13.64%	6.60%	*7.46%*	24.10%
14	2,346	3.37	47	1.12	21.46%	12.68%	14.81%	7.77%	*7.66%*	24.53%
15	2,086	3.32	51	1.16	20.62%	11.69%	13.58%	6.54%	*7.84%*	25.14%
16	1,808	3.26	51	1.15	21.52%	13.15%	15.21%	8.17%	*8.06%*	24.32%
17	1,558	3.19	51	1.19	21.82%	14.48%	16.55%	9.51%	*8.29%*	24.06%
18	1,347	3.13	54	1.19	23.34%	13.05%	15.45%	8.41%	*8.52%*	24.68%
19	1,172	3.07	51	1.20	23.31%	12.77%	15.13%	8.09%	*8.73%*	24.91%
20	977	2.99	69	1.26	25.28%	13.30%	16.11%	9.07%	*9.01%*	25.28%
21	838	2.92	54	1.25	24.42%	14.69%	17.22%	10.18%	*9.25%*	26.38%
22	697	2.84	81	1.26	24.28%	13.09%	15.71%	8.67%	*9.53%*	26.11%
23	515	2.71	117	1.23	25.22%	14.29%	17.05%	10.01%	*10.00%*	26.14%
24	331	2.52	146	1.27	25.56%	15.06%	17.78%	10.74%	*10.67%*	26.47%
25	111	2.04	354	1.29	32.12%	17.48%	21.63%	14.59%	*12.36%*	29.41%
High financial risk			574	1.62	35.86%	13.67%	18.94%	11.90%		43.14%

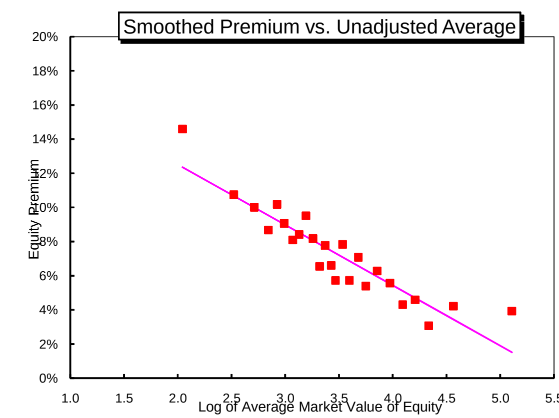
	Geometric Average Return	Arithmetic Average Return	Arithmetic Average Risk Premium
Large Stocks (Ibbotson SBBI data)	9.39%	10.88%	3.84%
Small Stocks (Ibbotson SBBI data)	13.07%	15.96%	8.92%
Long-Term Treasury Income (Ibbotson SBBI data)	7.01%	7.04%	

Equity Risk Premium Study: Data through December 31, 2008
Data Smoothing with Regression Analysis
Dependent Variable: Average Premium
Independent Variable: Log of Average Market Value of Equity

Regression Output:

Constant		19.601%
Std Err of Y Est		1.044%
R Squared		85%
No. of Observations		25
Degrees of Freedom		23
X Coefficient(s)	-3.542%	
Std Err of Coef.	0.315%	
t-Statistic	-11.23	

*Smoothed Premium = 19.601% - 3.542% * Log(Market Value)*



Duff & Phelps' Risk Premium Report

Categorizing risk of High Financial Risk portfolio companies by Altman "z" score:

T_1 = Working Capital / Total Assets

T_2 = Retained Earnings / Total Assets

T_3= Earnings Before Interest and Taxes / Total Assets

T_4 = Market Value of Equity / Total Book Value of Liabilities

T_5 = Sales / Total Assets

$Z = 1.2 \times T_1 + 1.4 \times T_2 + 3.3 \times T_3 + .6 \times T_4 + .999 \times T_5$

Categorize companies and returns: $1.8 < z < 2.99$ = "grey zone"

$z < 1.8$ = Distress Zone

Analysis of High Financial Risk Portfolio by "z" score

Companies Ranked by Market Value of Equity **Exhibit H-A-1**

Historical Equity Risk Premium: Average Since 1963
High Bankruptcy Risk Company Data for Year Ending December 31, 2008

Portfolio Rank by Z Score	Average Mkt Value ($mils.)	Number as of 2008	Beta (SumBeta) Since '63	Standard Deviation of Returns	Geometric Average Return	Arithmetic Average Return	Arithmetic Average Risk Premium	Average Debt/ MVIC
3.0 +	1,901	229	1.57	35.03%	11.86%	16.92%	9.88%	22.53%
1.8 to 2.99	1,142	129	1.57	34.46%	13.15%	18.22%	11.18%	44.16%
< 1.8	2,716	216	1.70	43.29%	14.44%	21.41%	14.37%	58.07%
Large Stocks (Ibbotson SBBI data)					9.39%	10.88%	3.84%	
Small Stocks (Ibbotson SBBI data)					13.07%	15.96%	8.92%	
Long-Term Treasury Income (Ibbotson SBBI data)					7.01%	7.04%		

Duff & Phelps' Risk Premium Report – size measure by book value of equity

Companies Ranked by Book Value of Equity **Exhibit A-2**

Historical Equity Risk Premium: Average Since 1963
Data for Year Ending December 31, 2008

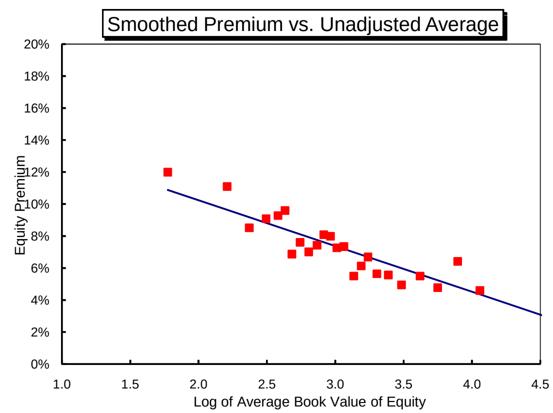
Portfolio Rank by Size	Average Book Val. ($mils.)	Log of Average Book Val.	Number as of 2008	Beta (SumBeta) Since '63	Standard Deviation of Returns	Geometric Average Return	Arithmetic Average Return	Arithmetic Average Risk Premium	*Smoothed Average Risk Premium*	Average Debt/ MVIC
1	37,502	4.57	38	0.81	16.42%	10.10%	11.35%	4.31%	*2.87%*	24.52%
2	11,465	4.06	34	0.85	16.64%	10.37%	11.64%	4.60%	*4.34%*	29.42%
3	7,877	3.90	35	0.90	17.85%	12.01%	13.46%	6.42%	*4.81%*	30.55%
4	5,622	3.75	33	0.92	17.11%	10.50%	11.82%	4.78%	*5.23%*	29.87%
5	4,184	3.62	36	1.01	18.50%	10.92%	12.54%	5.50%	*5.60%*	27.52%
6	3,055	3.49	33	1.01	19.33%	10.31%	11.99%	4.95%	*5.99%*	27.39%
7	2,447	3.39	38	1.04	18.44%	10.99%	12.61%	5.57%	*6.26%*	26.21%
8	2,016	3.30	39	1.08	18.63%	11.05%	12.68%	5.64%	*6.50%*	25.81%
9	1,739	3.24	35	1.05	19.44%	12.01%	13.73%	6.69%	*6.69%*	25.49%
10	1,551	3.19	36	1.07	19.06%	11.52%	13.17%	6.13%	*6.83%*	26.43%
11	1,368	3.14	44	1.07	18.74%	10.96%	12.54%	5.50%	*6.99%*	26.88%
12	1,157	3.06	45	1.06	20.61%	12.46%	14.39%	7.35%	*7.19%*	27.11%
13	1,029	3.01	42	1.09	20.43%	12.41%	14.31%	7.27%	*7.34%*	25.90%
14	923	2.97	49	1.11	20.27%	13.23%	15.03%	7.99%	*7.47%*	25.32%
15	825	2.92	44	1.10	20.28%	13.30%	15.13%	8.09%	*7.61%*	24.82%
16	736	2.87	46	1.17	20.50%	12.56%	14.47%	7.43%	*7.76%*	25.73%
17	640	2.81	49	1.18	21.23%	11.99%	14.06%	7.02%	*7.93%*	24.26%
18	553	2.74	59	1.18	20.83%	12.70%	14.65%	7.61%	*8.11%*	25.11%
19	482	2.68	45	1.20	21.53%	11.77%	13.91%	6.87%	*8.28%*	26.53%
20	430	2.63	56	1.23	22.60%	14.36%	16.64%	9.60%	*8.43%*	26.05%
21	382	2.58	61	1.21	21.58%	14.25%	16.33%	9.29%	*8.57%*	25.42%
22	312	2.49	84	1.21	24.28%	13.63%	16.13%	9.09%	*8.82%*	24.70%
23	235	2.37	112	1.24	25.13%	12.87%	15.56%	8.52%	*9.17%*	25.53%
24	162	2.21	142	1.26	26.01%	15.19%	18.14%	11.10%	*9.64%*	25.67%
25	60	1.77	394	1.30	31.70%	15.06%	19.04%	12.00%	*10.88%*	25.71%
High financial risk			574	1.61	37.10%	13.38%	18.77%	11.73%		42.77%
Large Stocks (Ibbotson SBBI data)						9.39%	10.88%	3.84%		
Small Stocks (Ibbotson SBBI data)						13.07%	15.96%	8.92%		
Long-Term Treasury Income (Ibbotson SBBI data)						7.01%	7.04%			

Equity Risk Premium Study: Data through December 31, 2008
Data Smoothing with Regression Analysis
Dependent Variable: Average Premium
Independent Variable: Log of Average Book Value of Equity

Regression Output:

Constant		15.965%
Std Err of Y Est		0.917%
R Squared		79%
No. of Observations		25
Degrees of Freedom		23
X Coefficient(s)	-2.863%	
Std Err of Coef.	0.303%	
t-Statistic	-9.44	

*Smoothed Premium = 15.965% - 2.863% * Log(Book Value)*



Analysis of High Financial Risk Portfolio by "z" score

Companies Ranked by Book Value of Equity **Exhibit H-A-2**

Historical Equity Risk Premium: Average Since 1963
High Bankruptcy Risk Company Data for Year Ending December 31, 2008

Portfolio Rank by Z Score	Average Book Val. ($mils.)	Number as of 2008	Beta (SumBeta) Since '63	Standard Deviation of Returns	Geometric Average Return	Arithmetic Average Return	Arithmetic Average Risk Premium	Average Debt/ MVIC
3.0 +	392	229	1.57	35.51%	11.88%	17.02%	9.98%	22.73%
1.8 to 2.99	351	129	1.56	36.50%	13.88%	19.16%	12.12%	43.96%
< 1.8	1,072	216	1.68	49.26%	14.32%	22.04%	15.00%	58.95%

	Geometric Average Return	Arithmetic Average Return	Arithmetic Average Risk Premium
Large Stocks (Ibbotson SBBI data)	9.39%	10.88%	3.84%
Small Stocks (Ibbotson SBBI data)	13.07%	15.96%	8.92%
Long-Term Treasury Income (Ibbotson SBBI data)	7.01%	7.04%	

Duff & Phelps' Risk Premium Report – size measure by market value of equity

Companies Ranked by Market Value of Equity | **Premium over CAPM** | **Exhibit B-1**

Historical Equity Risk Premium: Average Since 1963
Data for Year Ending December 31, 2008

Portfolio Rank by Size	Average Mkt Value ($mils.)	Log of Size	Beta (SumBeta) Since '63	Arithmetic Average Return	Arithmetic Average Risk Premium	Indicated CAPM Premium	Premium over CAPM	Smoothed Premium over CAPM
1	127,995	5.11	0.86	10.97%	3.93%	3.29%	0.64%	-1.72%
2	36,587	4.56	0.92	11.25%	4.21%	3.55%	0.67%	-0.15%
3	21,569	4.33	0.97	10.11%	3.07%	3.72%	-0.65%	0.52%
4	16,126	4.21	0.98	11.63%	4.59%	3.76%	0.83%	0.88%
5	12,369	4.09	0.97	11.34%	4.30%	3.71%	0.59%	1.22%
6	9,399	3.97	1.04	12.60%	5.56%	3.99%	1.58%	1.56%
7	7,150	3.85	1.03	13.32%	6.28%	3.97%	2.31%	1.91%
8	5,597	3.75	1.04	12.43%	5.39%	3.99%	1.40%	2.21%
9	4,775	3.68	1.11	14.12%	7.08%	4.25%	2.83%	2.41%
10	3,948	3.60	1.07	12.76%	5.72%	4.13%	1.60%	2.65%
11	3,418	3.53	1.15	14.87%	7.83%	4.40%	3.43%	2.83%
12	2,933	3.47	1.12	12.76%	5.72%	4.31%	1.41%	3.03%
13	2,675	3.43	1.09	13.64%	6.60%	4.19%	2.41%	3.14%
14	2,346	3.37	1.12	14.81%	7.77%	4.31%	3.46%	3.31%
15	2,086	3.32	1.16	13.58%	6.54%	4.47%	2.07%	3.45%
16	1,808	3.26	1.15	15.21%	8.17%	4.42%	3.75%	3.63%
17	1,558	3.19	1.19	16.55%	9.51%	4.55%	4.96%	3.82%
18	1,347	3.13	1.19	15.45%	8.41%	4.58%	3.83%	4.00%
19	1,172	3.07	1.20	15.13%	8.09%	4.59%	3.50%	4.18%
20	977	2.99	1.26	16.11%	9.07%	4.83%	4.24%	4.41%
21	838	2.92	1.25	17.22%	10.18%	4.79%	5.39%	4.60%
22	697	2.84	1.26	15.71%	8.67%	4.83%	3.84%	4.83%
23	515	2.71	1.23	17.05%	10.01%	4.71%	5.29%	5.21%
24	331	2.52	1.27	17.78%	10.74%	4.88%	5.85%	5.77%
25	111	2.04	1.29	21.63%	14.59%	4.94%	9.65%	7.15%
High financial risk			1.62	18.94%	11.90%	6.23%	5.67%	

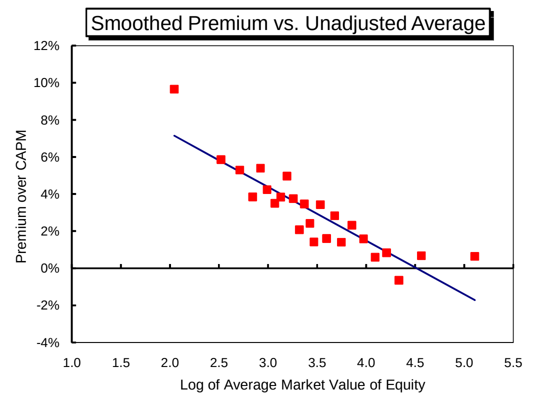
	Arithmetic Average Return	Arithmetic Average Risk Premium
Large Stocks (Ibbotson SBBI data)	10.88%	3.84%
Small Stocks (Ibbotson SBBI data)	15.96%	8.92%
Long-Term Treasury Income (Ibbotson SBBI data)	7.04%	

Equity Risk Premium Study: Data through December 31, 2008
Data Smoothing with Regression Analysis
Dependent Variable: Premium over CAPM
Independent Variable: Log of Average Market Value of Equity

Regression Output:

Constant		13.059%
Std Err of Y Est		1.048%
R Squared		78%
No. of Observations		25
Degrees of Freedom		23
X Coefficient(s)	-2.894%	
Std Err of Coef.	0.316%	
t-Statistic	-9.14	

*Smoothed Premium = 13.059% - 2.894% * Log(Market Value)*



Analysis of High Financial Risk Portfolio by "z" score

Companies Ranked by Market Value of Equity **Premium over CAPM** **Exhibit H-B-1**

Historical Equity Risk Premium: Average Since 1963
High Bankruptcy Risk Company Data for Year Ending December 31, 2008

Portfolio Rank by Z Score	Average Mkt Value ($mils.)	Beta (SumBeta) Since '63	Arithmetic Average Return	Arithmetic Average Risk Premium	Indicated CAPM Premium	Premium over CAPM
3.0 +	1,901	1.57	16.92%	9.88%	6.01%	3.86%
1.8 to 2.99	1,142	1.57	18.22%	11.18%	6.04%	5.14%
< 1.8	2,716	1.70	21.41%	14.37%	6.52%	7.84%

Large Stocks (Ibbotson SBBI data)	10.88%	3.84%
Small Stocks (Ibbotson SBBI data)	15.96%	8.92%
Long-Term Treasury Income (Ibbotson SBBI data)	7.04%	

Duff & Phelps' Risk Premium Report – size measure by book value of equity

Companies Ranked by Book Value of Equity **Premium over CAPM** **Exhibit B-2**

Historical Equity Risk Premium: Average Since 1963
Data for Year Ending December 31, 2008

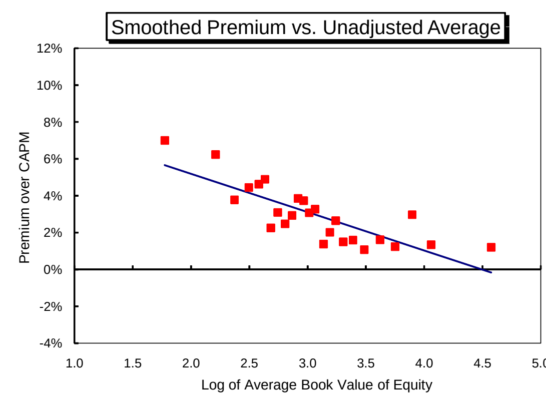
Portfolio Rank by Size	Average Book Val. ($mils.)	Log of Size	Beta (SumBeta) Since '63	Arithmetic Average Return	Arithmetic Average Risk Premium	Indicated CAPM Premium	Premium over CAPM	Smoothed Premium over CAPM
1	37,502	4.57	0.81	11.35%	4.31%	3.11%	1.20%	-0.16%
2	11,465	4.06	0.85	11.64%	4.60%	3.26%	1.34%	0.91%
3	7,877	3.90	0.90	13.46%	6.42%	3.45%	2.97%	1.25%
4	5,622	3.75	0.92	11.82%	4.78%	3.55%	1.23%	1.55%
5	4,184	3.62	1.01	12.54%	5.50%	3.89%	1.61%	1.82%
6	3,055	3.49	1.01	11.99%	4.95%	3.88%	1.07%	2.11%
7	2,447	3.39	1.04	12.61%	5.57%	3.99%	1.58%	2.31%
8	2,016	3.30	1.08	12.68%	5.64%	4.15%	1.49%	2.48%
9	1,739	3.24	1.05	13.73%	6.69%	4.05%	2.64%	2.61%
10	1,551	3.19	1.07	13.17%	6.13%	4.12%	2.01%	2.72%
11	1,368	3.14	1.07	12.54%	5.50%	4.13%	1.38%	2.83%
12	1,157	3.06	1.06	14.39%	7.35%	4.08%	3.27%	2.98%
13	1,029	3.01	1.09	14.31%	7.27%	4.20%	3.07%	3.09%
14	923	2.97	1.11	15.03%	7.99%	4.25%	3.73%	3.19%
15	825	2.92	1.10	15.13%	8.09%	4.24%	3.85%	3.29%
16	736	2.87	1.17	14.47%	7.43%	4.50%	2.93%	3.39%
17	640	2.81	1.18	14.06%	7.02%	4.55%	2.47%	3.52%
18	553	2.74	1.18	14.65%	7.61%	4.52%	3.09%	3.65%
19	482	2.68	1.20	13.91%	6.87%	4.62%	2.25%	3.77%
20	430	2.63	1.23	16.64%	9.60%	4.71%	4.89%	3.88%
21	382	2.58	1.21	16.33%	9.29%	4.66%	4.63%	3.98%
22	312	2.49	1.21	16.13%	9.09%	4.65%	4.45%	4.16%
23	235	2.37	1.24	15.56%	8.52%	4.74%	3.78%	4.42%
24	162	2.21	1.26	18.14%	11.10%	4.86%	6.24%	4.76%
25	60	1.77	1.30	19.04%	12.00%	4.99%	7.00%	5.66%
High financial risk			1.61	18.77%	11.73%	6.18%	5.56%	
Large Stocks (Ibbotson SBBI data)				10.88%	3.84%			
Small Stocks (Ibbotson SBBI data)				15.96%	8.92%			
Long-Term Treasury Income (Ibbotson SBBI data)				7.04%				

Equity Risk Premium Study: Data through December 31, 2008
Data Smoothing with Regression Analysis
Dependent Variable: Premium over CAPM
Independent Variable: Log of Average Book Value of Equity

Regression Output:

Constant		9.353%
Std Err of Y Est		0.953%
R Squared		65%
No. of Observations		25
Degrees of Freedom		23
X Coefficient(s)	-2.080%	
Std Err of Coef.	0.315%	
t-Statistic	-6.60	

*Smoothed Premium = 9.353% - 2.080% * Log(Book Value)*



Analysis of High Financial Risk Portfolio by "z" score

Companies Ranked by Book Value of Equity **Premium over CAPM** **Exhibit H-B-2**

Historical Equity Risk Premium: Average Since 1963
High Bankruptcy Risk Company Data for Year Ending December 31, 2008

Portfolio Rank by Z Score	Average Book Val. ($mils.)	Beta (SumBeta) Since '63	Arithmetic Average Return	Arithmetic Average Risk Premium	Indicated CAPM Premium	Premium over CAPM
3.0 +	392	1.57	17.02%	9.98%	6.01%	3.97%
1.8 to 2.99	351	1.56	19.16%	12.12%	5.99%	6.13%
< 1.8	1,072	1.68	22.04%	15.00%	6.47%	8.53%
Large Stocks (Ibbotson SBBI data)			10.88%	3.84%		
Small Stocks (Ibbotson SBBI data)			15.96%	8.92%		
Long-Term Treasury Income (Ibbotson SBBI data)			7.04%			

Duff & Phelps' Risk Premium Report – risk based on operating margin

Companies Ranked by Operating Margin **Exhibit D-1**

Historical Equity Risk Premium: Average Since 1963
Data for Year Ending December 31, 2008

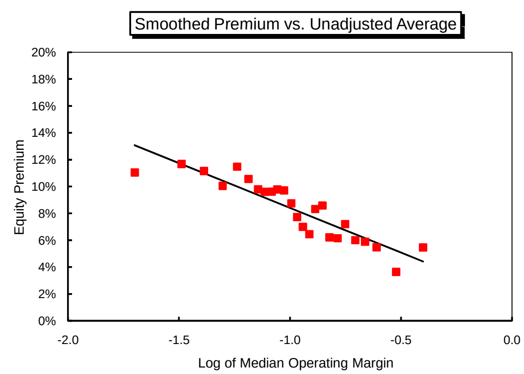
Portfolio Rank	Median Operating Margin	Log of Median Op Margin	Number as of 2008	Beta (SumBeta) Since '63	Standard Deviation of Returns	Geometric Average Return	Arithmetic Average Return	Arithmetic Average Risk Premium	*Smoothed Average Risk Premium*	Average Debt/ MVIC
1	39.7%	-0.40	55	0.85	17.98%	11.07%	12.50%	5.46%	*4.42%*	26.93%
2	30.0%	-0.52	65	0.78	17.35%	9.31%	10.67%	3.63%	*5.23%*	29.58%
3	24.5%	-0.61	60	0.83	17.55%	11.09%	12.51%	5.47%	*5.81%*	28.00%
4	21.8%	-0.66	51	0.94	17.33%	11.53%	12.93%	5.89%	*6.16%*	24.44%
5	19.7%	-0.71	62	0.99	18.10%	11.54%	13.04%	6.00%	*6.45%*	20.85%
6	17.7%	-0.75	67	1.06	19.55%	12.54%	14.24%	7.20%	*6.76%*	17.75%
7	16.4%	-0.79	66	1.13	19.42%	11.53%	13.19%	6.15%	*6.98%*	17.76%
8	15.0%	-0.82	57	1.13	19.74%	11.41%	13.25%	6.21%	*7.23%*	19.55%
9	14.0%	-0.85	51	1.15	20.47%	13.83%	15.63%	8.59%	*7.44%*	19.22%
10	13.0%	-0.89	49	1.18	22.38%	13.21%	15.37%	8.33%	*7.65%*	21.09%
11	12.2%	-0.91	58	1.21	21.07%	11.51%	13.49%	6.45%	*7.83%*	21.49%
12	11.4%	-0.94	61	1.14	19.87%	12.26%	14.03%	6.99%	*8.03%*	21.90%
13	10.8%	-0.97	54	1.21	22.05%	12.51%	14.76%	7.72%	*8.20%*	21.91%
14	10.1%	-0.99	64	1.19	22.88%	13.38%	15.79%	8.75%	*8.38%*	22.96%
15	9.4%	-1.03	66	1.22	23.47%	14.30%	16.75%	9.71%	*8.59%*	23.56%
16	8.8%	-1.06	60	1.15	22.32%	14.59%	16.83%	9.79%	*8.80%*	25.30%
17	8.3%	-1.08	60	1.26	25.02%	13.96%	16.65%	9.61%	*8.96%*	25.85%
18	7.7%	-1.11	65	1.23	24.02%	14.04%	16.64%	9.60%	*9.18%*	26.10%
19	7.2%	-1.14	58	1.28	25.09%	14.00%	16.83%	9.79%	*9.37%*	27.56%
20	6.5%	-1.19	66	1.26	25.84%	14.75%	17.61%	10.57%	*9.66%*	29.28%
21	5.8%	-1.24	84	1.24	25.73%	15.76%	18.52%	11.48%	*10.00%*	29.94%
22	5.0%	-1.30	72	1.26	26.20%	14.12%	17.09%	10.05%	*10.44%*	30.21%
23	4.1%	-1.39	81	1.30	26.54%	15.10%	18.20%	11.16%	*11.00%*	31.75%
24	3.2%	-1.49	83	1.32	27.63%	15.39%	18.73%	11.69%	*11.67%*	32.34%
25	2.0%	-1.70	114	1.28	28.87%	14.39%	18.09%	11.05%	*13.08%*	31.38%
High financial risk			574	1.62	35.93%	13.91%	19.22%	12.18%		43.49%
Large Stocks (Ibbotson SBBI data)						9.39%	10.88%	3.84%		
Small Stocks (Ibbotson SBBI data)						13.07%	15.96%	8.92%		
Long-Term Treasury Income (Ibbotson SBBI data)						7.01%	7.04%			

Equity Risk Premium Study: Data through December 31, 2008
Data Smoothing with Regression Analysis
Dependent Variable: Average Premium
Independent Variable: Log of Median Operating Margin

Regression Output:

Constant		1.744%
Std Err of Y Est		0.965%
R Squared		82%
No. of Observations		25
Degrees of Freedom		23
X Coefficient(s)	-6.669%	
Std Err of Coef.	0.647%	
t-Statistic	-10.31	

*Smoothed Premium = 1.744% - 6.669% * Log(Operating Margin)*



Analysis of High Financial Risk Portfolio by "z" score

Companies Ranked by Operating Margin **Exhibit H-D-1**

Historical Equity Risk Premium: Average Since 1963
High Bankruptcy Risk Company Data for Year Ending December 31, 2008

Portfolio Rank	Median Operating Margin	Number as of 2008	Beta (SumBeta) Since '63	Standard Deviation of Returns	Geometric Average Return	Arithmetic Average Return	Arithmetic Average Risk Premium	Average Debt/ MVIC
3.0 +	1.1%	229	1.57	35.63%	12.06%	17.23%	10.19%	22.68%
1.8 to 2.99	2.5%	129	1.57	34.47%	13.16%	18.24%	11.20%	44.33%
< 1.8	2.2%	216	1.70	43.33%	14.78%	21.85%	14.81%	58.63%
Large Stocks (Ibbotson SBBI data)					9.39%	10.88%	3.84%	
Small Stocks (Ibbotson SBBI data)					13.07%	15.96%	8.92%	
Long-Term Treasury Income (Ibbotson SBBI data)					7.01%	7.04%		

Estimating the Cost of Capital for Pricing a Potential Acquisition

Corporate executives and their advisors often forget the basic premises of matching risk and return and incorrectly price their cost of capital, leading to value *decreasing* investments:

- Cost of equity used for an investment should reflect the risk of the investment, not the risk characteristics of the investor who raised the funds
- Cost of debt should reflect the debt capacity and cost of debt of the target.
- Too many acquiring firms build their lower cost of equity and lower borrowing costs into the valuation of a target firm, essentially transferring wealth from the acquiring firm's shareholders to the target firm's shareholders.